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(71) Applicant (for all designated States except US): **CORIXA CORPORATION** [US/US]; Suite 200, 1124 Columbia Street, Seattle, WA 98104 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WANG, Tongtong** [US/US]; 8049 NE 28th Street, Medina, WA 98039 (US). **BANGUR, Chaitanya, S.** [IN/US]; Apartment J101, 2102 North 105th Street, Seattle, WA 98133 (US). **LODES, Michael, J.** [US/US]; 9223 - 36th Avenue SW, Seattle, WA 98126 (US). **FANGER, Gary, R.** [US/US]; 15906 -29th Drive SE, Mill Creek, WA 98012 (US). **VEDVICK, Thomas, S.** [US/US]; 124 South 300th Place, Federal Way, WA 98003 (US). **CARTER, Darrick** [US/US]; 321 Summit Avenue East, Seattle, WA 98102 (US). **RETTTER, Marc, W.** [US/US]; 33402 NE 43rd Place, Carnation, WA 98104 (US). **MANNION, Jane** [US/US]; 8904 - 192nd Street SW, Edmonds, WA 98026 (US).(74) Agents: **POTTER, Jane, E., R.**; Seed Intellectual Property Law Group PLLC, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 et al. (US).(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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(54) Title: COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF LUNG CANCER

(57) Abstract: Compositions and methods for the therapy and diagnosis of cancer, such as lung cancer, are disclosed. Compositions may comprise one or more lung tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a lung tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as lung cancer. Diagnostic methods based on detecting a lung tumor protein, or mRNA encoding such a protein, in a sample are also provided.



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COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF LUNG CANCER

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to therapy and diagnosis of cancer, such as lung cancer. The invention is more specifically related to polypeptides comprising at least a portion of a lung tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in compositions for prevention and treatment of lung cancer, and for the diagnosis and monitoring of such cancers.

10 BACKGROUND OF THE INVENTION

Cancer is a significant health problem throughout the world. Although advances have been made in detection and therapy of cancer, no vaccine or other universally successful method for prevention or treatment is currently available. Current therapies, which are generally based on a combination of chemotherapy or surgery and radiation, continue to prove inadequate in many patients.

Lung cancer is the primary cause of cancer death among both men and women in the U.S., with an estimated 172,000 new cases being reported in 1994. The five-year survival rate among all lung cancer patients, regardless of the stage of disease at diagnosis, is only 13%. This contrasts with a five-year survival rate of 46% among cases detected while the disease is still localized. However, only 16% of lung cancers are discovered before the disease has spread.

Early detection is difficult since clinical symptoms are often not seen until the disease has reached an advanced stage. Currently, diagnosis is aided by the use of chest x-rays, analysis of the type of cells contained in sputum and fiberoptic examination of the bronchial passages. Treatment regimens are determined by the type and stage of the cancer, and include surgery, radiation therapy and/or chemotherapy.

In spite of considerable research into therapies for this and other cancers, lung cancer remains difficult to diagnose and treat effectively. Accordingly, there is a

need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods
5 for the diagnosis and therapy of cancer, such as lung cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a lung tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises a sequence that is
10 encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236,
15 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826; (b) variants of a sequence recited in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134,
20 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826; and (c) complements of a sequence of (a) or (b). In specific embodiments, the polypeptides
25 of the present invention comprise at least a portion of a tumor protein that includes an amino acid sequence selected from the group consisting of sequences recited in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827, and variants thereof.

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least

15 amino acid residues of a lung tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a
5 physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines, or immunogenic compositions, for prophylactic or therapeutic use are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

10 The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a lung tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as
15 described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines, or immunogenic compositions, are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as
20 described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

Within related aspects, pharmaceutical compositions comprising a fusion
25 protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines, or immunogenic compositions, are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an immunostimulant.

30 Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a

patient a pharmaceutical composition or immunogenic composition as recited above. The patient may be afflicted with lung cancer, in which case the methods provide treatment for the disease, or patient considered at risk for such a disease may be treated prophylactically.

5 The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a lung tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

10 Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

 Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a lung tumor protein, comprising contacting T
15 cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

20 Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

 The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺
25 and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a lung tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the
30 patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that
5 binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be lung cancer.

The present invention also provides, within other aspects, methods for
10 monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in
15 time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a)
20 contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the
25 presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an
30 oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein; (b) detecting in the sample an amount of a polynucleotide
5 that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as
10 monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All
15 references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

SEQUENCE IDENTIFIERS

SEQ ID NO: 1 is the determined cDNA sequence for clone #19038, also referred to as L845P.

20 SEQ ID NO: 2 is the determined cDNA sequence for clone #19036.

SEQ ID NO: 3 is the determined cDNA sequence for clone #19034.

SEQ ID NO: 4 is the determined cDNA sequence for clone #19033.

SEQ ID NO: 5 is the determined cDNA sequence for clone #19032.

25 SEQ ID NO: 6 is the determined cDNA sequence for clone #19030, also referred to as L559S.

SEQ ID NO: 7 is the determined cDNA sequence for clone #19029.

SEQ ID NO: 8 is the determined cDNA sequence for clone #19025.

SEQ ID NO: 9 is the determined cDNA sequence for clone #19023.

SEQ ID NO: 10 is the determined cDNA sequence for clone #18929.

30 SEQ ID NO: 11 is the determined cDNA sequence for clone #19010.

SEQ ID NO: 12 is the determined cDNA sequence for clone #19009.

SEQ ID NO: 13 is the determined cDNA sequence for clones #19005, 19007, 19016 and 19017.

SEQ ID NO: 14 is the determined cDNA sequence for clone #19004.

5 SEQ ID NO: 15 is the determined cDNA sequence for clones #19002 and 18965.

SEQ ID NO: 16 is the determined cDNA sequence for clone #18998.

SEQ ID NO: 17 is the determined cDNA sequence for clone #18997.

SEQ ID NO: 18 is the determined cDNA sequence for clone #18996.

10 SEQ ID NO: 19 is the determined cDNA sequence for clone #18995.

SEQ ID NO: 20 is the determined cDNA sequence for clone #18994, also known as L846P.

SEQ ID NO: 21 is the determined cDNA sequence for clone #18992.

SEQ ID NO: 22 is the determined cDNA sequence for clone #18991.

15 SEQ ID NO: 23 is the determined cDNA sequence for clone #18990, also referred to as clone #20111.

SEQ ID NO: 24 is the determined cDNA sequence for clone #18987.

SEQ ID NO: 25 is the determined cDNA sequence for clone #18985, also referred as L839P.

20 SEQ ID NO: 26 is the determined cDNA sequence for clone #18984, also referred to as L847P.

SEQ ID NO: 27 is the determined cDNA sequence for clone #18983.

SEQ ID NO: 28 is the determined cDNA sequence for clones #18976 and 18980.

25 SEQ ID NO: 29 is the determined cDNA sequence for clone #18975.

SEQ ID NO: 30 is the determined cDNA sequence for clone #18974.

SEQ ID NO: 31 is the determined cDNA sequence for clone #18973.

SEQ ID NO: 32 is the determined cDNA sequence for clone #18972.

30 SEQ ID NO: 33 is the determined cDNA sequence for clone #18971, also referred to as L801P.

SEQ ID NO: 34 is the determined cDNA sequence for clone #18970.

SEQ ID NO: 35 is the determined cDNA sequence for clone #18966.

SEQ ID NO: 36 is the determined cDNA sequence for clones #18964,
18968 and 19039.

SEQ ID NO: 37 is the determined cDNA sequence for clone #18960.

5 SEQ ID NO: 38 is the determined cDNA sequence for clone #18959.

SEQ ID NO: 39 is the determined cDNA sequence for clones #18958
and 18982.

SEQ ID NO: 40 is the determined cDNA sequence for clones #18956
and 19015.

10 SEQ ID NO: 41 is the determined cDNA sequence for clone #18954,
also referred to L848P.

SEQ ID NO: 42 is the determined cDNA sequence for clone #18951.

SEQ ID NO: 43 is the determined cDNA sequence for clone #18950.

15 SEQ ID NO: 44 is the determined cDNA sequence for clones #18949
and 19024, also referred to as L844P.

SEQ ID NO: 45 is the determined cDNA sequence for clone #18948.

SEQ ID NO: 46 is the determined cDNA sequence for clone #18947,
also referred to as L840P.

20 SEQ ID NO: 47 is the determined cDNA sequence for clones #18946,
18953, 18969 and 19027.

SEQ ID NO: 48 is the determined cDNA sequence for clone #18942.

SEQ ID NO: 49 is the determined cDNA sequence for clone #18940,
18962, 18963, 19006, 19008, 19000, and 19031.

SEQ ID NO: 50 is the determined cDNA sequence for clone #18939.

25 SEQ ID NO: 51 is the determined cDNA sequence for clones #18938
and 18952.

SEQ ID NO: 52 is the determined cDNA sequence for clone #18938.

SEQ ID NO: 53 is the determined cDNA sequence for clone #18937.

30 SEQ ID NO: 54 is the determined cDNA sequence for clones #18934,
18935, 18993 and 19022, also referred to as L548S.

SEQ ID NO: 55 is the determined cDNA sequence for clone #18932.

SEQ ID NO: 56 is the determined cDNA sequence for clones #18931 and 18936.

SEQ ID NO: 57 is the determined cDNA sequence for clone #18930.

SEQ ID NO: 58 is the determined cDNA sequence for clone #19014,
5 also referred to as L773P.

SEQ ID NO: 59 is the determined cDNA sequence for clone #19127.

SEQ ID NO: 60 is the determined cDNA sequence for clones #19057 and 19064.

SEQ ID NO: 61 is the determined cDNA sequence for clone #19122.

10 SEQ ID NO: 62 is the determined cDNA sequence for clones #19120 and 18121.

SEQ ID NO: 63 is the determined cDNA sequence for clone #19118.

SEQ ID NO: 64 is the determined cDNA sequence for clone #19117.

SEQ ID NO: 65 is the determined cDNA sequence for clone #19116.

15 SEQ ID NO: 66 is the determined cDNA sequence for clone #19114.

SEQ ID NO: 67 is the determined cDNA sequence for clone #19112, also known as L561S.

SEQ ID NO: 68 is the determined cDNA sequence for clone #19110.

SEQ ID NO: 69 is the determined cDNA sequence for clone #19107,
20 also referred to as L552S.

SEQ ID NO: 70 is the determined cDNA sequence for clone #19106, also referred to as L547S.

SEQ ID NO: 71 is the determined cDNA sequence for clones #19105 and 19111.

25 SEQ ID NO: 72 is the determined cDNA sequence for clone #19099.

SEQ ID NO: 73 is the determined cDNA sequence for clones #19095, 19104 and 19125, also referred to as L549S.

SEQ ID NO: 74 is the determined cDNA sequence for clone #19094.

SEQ ID NO: 75 is the determined cDNA sequence for clones #19089
30 and 19101.

SEQ ID NO: 76 is the determined cDNA sequence for clone #19088.

SEQ ID NO: 77 is the determined cDNA sequence for clones #19087, 19092, 19096, 19100 and 19119.

SEQ ID NO: 78 is the determined cDNA sequence for clone #19086.

SEQ ID NO: 79 is the determined cDNA sequence for clone #19085,
5 also referred to as L550S.

SEQ ID NO: 80 is the determined cDNA sequence for clone #19084,
also referred to as clone #19079.

SEQ ID NO: 81 is the determined cDNA sequence for clone #19082.

SEQ ID NO: 82 is the determined cDNA sequence for clone #19080.

10 SEQ ID NO: 83 is the determined cDNA sequence for clone #19077.

SEQ ID NO: 84 is the determined cDNA sequence for clone #19076,
also referred to as L551S.

SEQ ID NO: 85 is the determined cDNA sequence for clone #19074,
also referred to as clone #20102.

15 SEQ ID NO: 86 is the determined cDNA sequence for clone #19073,
also referred to as L560S.

SEQ ID NO: 87 is the determined cDNA sequence for clones #19072
and 19115.

SEQ ID NO: 88 is the determined cDNA sequence for clone #19071.

20 SEQ ID NO: 89 is the determined cDNA sequence for clone #19070.

SEQ ID NO: 90 is the determined cDNA sequence for clone #19069.

SEQ ID NO: 91 is the determined cDNA sequence for clone #19068,
also referred to L563S.

SEQ ID NO: 92 is the determined cDNA sequence for clone #19066.

25 SEQ ID NO: 93 is the determined cDNA sequence for clone #19065.

SEQ ID NO: 94 is the determined cDNA sequence for clone #19063.

SEQ ID NO: 95 is the determined cDNA sequence for clones #19061,
19081, 19108 and 19109.

SEQ ID NO: 96 is the determined cDNA sequence for clones #19060,
30 19067 and 19083, also referred to as L548S.

SEQ ID NO: 97 is the determined cDNA sequence for clones #19059
and 19062.

SEQ ID NO: 98 is the determined cDNA sequence for clone #19058.

SEQ ID NO: 99 is the determined cDNA sequence for clone #19124.

5 SEQ ID NO: 100 is the determined cDNA sequence for clone #18929.

SEQ ID NO: 101 is the determined cDNA sequence for clone #18422.

SEQ ID NO: 102 is the determined cDNA sequence for clone #18425.

SEQ ID NO: 103 is the determined cDNA sequence for clone #18431.

SEQ ID NO: 104 is the determined cDNA sequence for clone #18433.

10 SEQ ID NO: 105 is the determined cDNA sequence for clone #18444.

SEQ ID NO: 106 is the determined cDNA sequence for clone #18449.

SEQ ID NO: 107 is the determined cDNA sequence for clone #18451.

SEQ ID NO: 108 is the determined cDNA sequence for clone #18452.

SEQ ID NO: 109 is the determined cDNA sequence for clone #18455.

15 SEQ ID NO: 110 is the determined cDNA sequence for clone #18457.

SEQ ID NO: 111 is the determined cDNA sequence for clone #18466.

SEQ ID NO: 112 is the determined cDNA sequence for clone #18468.

SEQ ID NO: 113 is the determined cDNA sequence for clone #18471.

SEQ ID NO: 114 is the determined cDNA sequence for clone #18475.

20 SEQ ID NO: 115 is the determined cDNA sequence for clone #18476.

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SEQ ID NO: 117 is the determined cDNA sequence for clone #20631.

SEQ ID NO: 118 is the determined cDNA sequence for clone #20634.

SEQ ID NO: 119 is the determined cDNA sequence for clone #20635.

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SEQ ID NO: 123 is the determined cDNA sequence for clone #20652.

SEQ ID NO: 124 is the determined cDNA sequence for clone #20653.

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SEQ ID NO: 128 is the determined cDNA sequence for clone #20661.
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SEQ ID NO: 132 is the determined cDNA sequence for clone #20671.
SEQ ID NO: 133 is the determined cDNA sequence for clone #20672.
SEQ ID NO: 134 is the determined cDNA sequence for clone #20675.
SEQ ID NO: 135 is the determined cDNA sequence for clone #20679.
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SEQ ID NO: 137 is the determined cDNA sequence for clone #20682.
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SEQ ID NO: 143 is the determined cDNA sequence for clone #20702.
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SEQ ID NO: 148 is the determined cDNA sequence for clone #19129.
SEQ ID NO: 149 is the determined cDNA sequence for clone #19131.1.
SEQ ID NO: 150 is the determined cDNA sequence for clone #19132.2.
25 SEQ ID NO: 151 is the determined cDNA sequence for clone #19133.
SEQ ID NO: 152 is the determined cDNA sequence for clone #19134.2.
SEQ ID NO: 153 is the determined cDNA sequence for clone #19135.2.
SEQ ID NO: 154 is the determined cDNA sequence for clone #19137.
SEQ ID NO: 155 is a first determined cDNA sequence for clone
30 #19138.1.

SEQ ID NO: 156 is a second determined cDNA sequence for clone
#19138.2.

SEQ ID NO: 157 is the determined cDNA sequence for clone #19139.

SEQ ID NO: 158 is a first determined cDNA sequence for clone
5 #19140.1.

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#19140.2.

SEQ ID NO: 160 is the determined cDNA sequence for clone #19141.

SEQ ID NO: 161 is the determined cDNA sequence for clone #19143.

10 SEQ ID NO: 162 is the determined cDNA sequence for clone #19144.

SEQ ID NO: 163 is a first determined cDNA sequence for clone
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SEQ ID NO: 164 is a second determined cDNA sequence for clone
#19145.2.

15 SEQ ID NO: 165 is the determined cDNA sequence for clone #19146.

SEQ ID NO: 166 is the determined cDNA sequence for clone #19149.1.

SEQ ID NO: 167 is the determined cDNA sequence for clone #19152.

SEQ ID NO: 168 is a first determined cDNA sequence for clone
#19153.1.

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#19153.2.

SEQ ID NO: 170 is the determined cDNA sequence for clone #19155.

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SEQ ID NO: 172 is the determined cDNA sequence for clone #19159.

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SEQ ID NO: 174 is a first determined cDNA sequence for clone
#19161.1.

SEQ ID NO: 175 is a second determined cDNA sequence for clone
#19161.2.

30 SEQ ID NO: 176 is the determined cDNA sequence for clone #19162.1.

SEQ ID NO: 177 is the determined cDNA sequence for clone #19166.

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SEQ ID NO: 179 is the determined cDNA sequence for clone #19171.
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#19173.1.
5 SEQ ID NO: 181 is a second determined cDNA sequence for clone
#19173.2.
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SEQ ID NO: 183 is the determined cDNA sequence for clone #19175.
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10 SEQ ID NO: 185 is the determined cDNA sequence for clone #19178.
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SEQ ID NO: 187 is the determined cDNA sequence for clone #19179.2.
SEQ ID NO: 188 is the determined cDNA sequence for clone #19180.
SEQ ID NO: 189 is a first determined cDNA sequence for clone
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#19182.2.
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SEQ ID NO: 192 is the determined cDNA sequence for clone #19185.1.
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SEQ ID NO: 197 is the determined cDNA sequence for clone #19192.
25 SEQ ID NO: 198 is the determined cDNA sequence for clone #19193.
SEQ ID NO: 199 is a first determined cDNA sequence for clone
#19194.1.
SEQ ID NO: 200 is a second determined cDNA sequence for clone
#19194.2.
30 SEQ ID NO: 201 is the determined cDNA sequence for clone #19197.

SEQ ID NO: 202 is a first determined cDNA sequence for clone
#19200.1.

SEQ ID NO: 203 is a second determined cDNA sequence for clone
#19200.2.

5 SEQ ID NO: 204 is the determined cDNA sequence for clone #19202.
SEQ ID NO: 205 is a first determined cDNA sequence for clone
#19204.1.

SEQ ID NO: 206 is a second determined cDNA sequence for clone
#19204.2.

10 SEQ ID NO: 207 is the determined cDNA sequence for clone #19205.
SEQ ID NO: 208 is a first determined cDNA sequence for clone
#19206.1.

SEQ ID NO: 209 is a second determined cDNA sequence for clone
#19206.2.

15 SEQ ID NO: 210 is the determined cDNA sequence for clone #19207.
SEQ ID NO: 211 is the determined cDNA sequence for clone #19208.
SEQ ID NO: 212 is a first determined cDNA sequence for clone
#19211.1.

SEQ ID NO: 213 is a second determined cDNA sequence for clone
20 #19211.2.

SEQ ID NO: 214 is a first determined cDNA sequence for clone
#19214.1.

SEQ ID NO: 215 is a second determined cDNA sequence for clone
#19214.2.

25 SEQ ID NO: 216 is the determined cDNA sequence for clone #19215.
SEQ ID NO: 217 is a first determined cDNA sequence for clone #19217.
2.

SEQ ID NO: 218 is a second determined cDNA sequence for clone
#19217.2.

30 SEQ ID NO: 219 is a first determined cDNA sequence for clone
#19218.1.

SEQ ID NO: 220 is a second determined cDNA sequence for clone
#19218.2.

SEQ ID NO: 221 is a first determined cDNA sequence for clone
#19220.1.

5 SEQ ID NO: 222 is a second determined cDNA sequence for clone
#19220.2.

SEQ ID NO: 223 is the determined cDNA sequence for clone #22015.
SEQ ID NO: 224 is the determined cDNA sequence for clone #22017.
SEQ ID NO: 225 is the determined cDNA sequence for clone #22019.

10 SEQ ID NO: 226 is the determined cDNA sequence for clone #22020.
SEQ ID NO: 227 is the determined cDNA sequence for clone #22023.
SEQ ID NO: 228 is the determined cDNA sequence for clone #22026.
SEQ ID NO: 229 is the determined cDNA sequence for clone #22027.
SEQ ID NO: 230 is the determined cDNA sequence for clone #22028.

15 SEQ ID NO: 231 is the determined cDNA sequence for clone #22032.
SEQ ID NO: 232 is the determined cDNA sequence for clone #22037.
SEQ ID NO: 233 is the determined cDNA sequence for clone #22045.
SEQ ID NO: 234 is the determined cDNA sequence for clone #22048.
SEQ ID NO: 235 is the determined cDNA sequence for clone #22050.

20 SEQ ID NO: 236 is the determined cDNA sequence for clone #22052.
SEQ ID NO: 237 is the determined cDNA sequence for clone #22053.
SEQ ID NO: 238 is the determined cDNA sequence for clone #22057.
SEQ ID NO: 239 is the determined cDNA sequence for clone #22066.
SEQ ID NO: 240 is the determined cDNA sequence for clone #22077.

25 SEQ ID NO: 241 is the determined cDNA sequence for clone #22085.
SEQ ID NO: 242 is the determined cDNA sequence for clone #22105.
SEQ ID NO: 243 is the determined cDNA sequence for clone #22108.
SEQ ID NO: 244 is the determined cDNA sequence for clone #22109.
SEQ ID NO: 245 is the determined cDNA sequence for clone #24842.

30 SEQ ID NO: 246 is the determined cDNA sequence for clone #24843.
SEQ ID NO: 247 is the determined cDNA sequence for clone #24845.

SEQ ID NO: 248 is the determined cDNA sequence for clone #24851.
SEQ ID NO: 249 is the determined cDNA sequence for clone #24852.
SEQ ID NO: 250 is the determined cDNA sequence for clone #24853.
SEQ ID NO: 251 is the determined cDNA sequence for clone #24854.
5 SEQ ID NO: 252 is the determined cDNA sequence for clone #24855.
SEQ ID NO: 253 is the determined cDNA sequence for clone #24860.
SEQ ID NO: 254 is the determined cDNA sequence for clone #24864.
SEQ ID NO: 255 is the determined cDNA sequence for clone #24866.
SEQ ID NO: 256 is the determined cDNA sequence for clone #24867.
10 SEQ ID NO: 257 is the determined cDNA sequence for clone #24868.
SEQ ID NO: 258 is the determined cDNA sequence for clone #24869.
SEQ ID NO: 259 is the determined cDNA sequence for clone #24870.
SEQ ID NO: 260 is the determined cDNA sequence for clone #24872.
SEQ ID NO: 261 is the determined cDNA sequence for clone #24873.
15 SEQ ID NO: 262 is the determined cDNA sequence for clone #24875.
SEQ ID NO: 263 is the determined cDNA sequence for clone #24882.
SEQ ID NO: 264 is the determined cDNA sequence for clone #24885.
SEQ ID NO: 265 is the determined cDNA sequence for clone #24886.
SEQ ID NO: 266 is the determined cDNA sequence for clone #24887.
20 SEQ ID NO: 267 is the determined cDNA sequence for clone #24888.
SEQ ID NO: 268 is the determined cDNA sequence for clone #24890.
SEQ ID NO: 269 is the determined cDNA sequence for clone #24896.
SEQ ID NO: 270 is the determined cDNA sequence for clone #24897.
SEQ ID NO: 271 is the determined cDNA sequence for clone #24899.
25 SEQ ID NO: 272 is the determined cDNA sequence for clone #24901.
SEQ ID NO: 273 is the determined cDNA sequence for clone #24902.
SEQ ID NO: 274 is the determined cDNA sequence for clone #24906.
SEQ ID NO: 275 is the determined cDNA sequence for clone #24912.
SEQ ID NO: 276 is the determined cDNA sequence for clone #24913.
30 SEQ ID NO: 277 is the determined cDNA sequence for clone #24920.
SEQ ID NO: 278 is the determined cDNA sequence for clone #24927.

SEQ ID NO: 279 is the determined cDNA sequence for clone #24930.
SEQ ID NO: 280 is the determined cDNA sequence for clone #26938.
SEQ ID NO: 281 is the determined cDNA sequence for clone #26939.
SEQ ID NO: 282 is the determined cDNA sequence for clone #26943.
5 SEQ ID NO: 283 is the determined cDNA sequence for clone #26948.
SEQ ID NO: 284 is the determined cDNA sequence for clone #26951.
SEQ ID NO: 285 is the determined cDNA sequence for clone #26955.
SEQ ID NO: 286 is the determined cDNA sequence for clone #26956.
SEQ ID NO: 287 is the determined cDNA sequence for clone #26959.
10 SEQ ID NO: 288 is the determined cDNA sequence for clone #26961.
SEQ ID NO: 289 is the determined cDNA sequence for clone #26962.
SEQ ID NO: 290 is the determined cDNA sequence for clone #26964.
SEQ ID NO: 291 is the determined cDNA sequence for clone #26966.
SEQ ID NO: 292 is the determined cDNA sequence for clone #26968.
15 SEQ ID NO: 293 is the determined cDNA sequence for clone #26972.
SEQ ID NO: 294 is the determined cDNA sequence for clone #26973.
SEQ ID NO: 295 is the determined cDNA sequence for clone #26974.
SEQ ID NO: 296 is the determined cDNA sequence for clone #26976.
SEQ ID NO: 297 is the determined cDNA sequence for clone #26977.
20 SEQ ID NO: 298 is the determined cDNA sequence for clone #26979.
SEQ ID NO: 299 is the determined cDNA sequence for clone #26980.
SEQ ID NO: 300 is the determined cDNA sequence for clone #26981.
SEQ ID NO: 301 is the determined cDNA sequence for clone #26984.
SEQ ID NO: 302 is the determined cDNA sequence for clone #26985.
25 SEQ ID NO: 303 is the determined cDNA sequence for clone #26986.
SEQ ID NO: 304 is the determined cDNA sequence for clone #26993.
SEQ ID NO: 305 is the determined cDNA sequence for clone #26994.
SEQ ID NO: 306 is the determined cDNA sequence for clone #26995.
SEQ ID NO: 307 is the determined cDNA sequence for clone #27003.
30 SEQ ID NO: 308 is the determined cDNA sequence for clone #27005.
SEQ ID NO: 309 is the determined cDNA sequence for clone #27010.

- SEQ ID NO: 310 is the determined cDNA sequence for clone #27011.
SEQ ID NO: 311 is the determined cDNA sequence for clone #27013.
SEQ ID NO: 312 is the determined cDNA sequence for clone #27016
SEQ ID NO: 313 is the determined cDNA sequence for clone #27017.
5 SEQ ID NO: 314 is the determined cDNA sequence for clone #27019.
SEQ ID NO: 315 is the determined cDNA sequence for clone #27028.
SEQ ID NO: 316 is the full-length cDNA sequence for clone #19060.
SEQ ID NO: 317 is the full-length cDNA sequence for clone #18964.
SEQ ID NO: 318 is the full-length cDNA sequence for clone #18929.
10 SEQ ID NO: 319 is the full-length cDNA sequence for clone #18991.
SEQ ID NO: 320 is the full-length cDNA sequence for clone #18996.
SEQ ID NO: 321 is the full-length cDNA sequence for clone #18966.
SEQ ID NO: 322 is the full-length cDNA sequence for clone #18951.
SEQ ID NO: 323 is the full-length cDNA sequence for clone #18973
15 (also known as L516S).
SEQ ID NO: 324 is the amino acid sequence for clone #19060.
SEQ ID NO: 325 is the amino acid sequence for clone #19063.
SEQ ID NO: 326 is the amino acid sequence for clone #19077.
SEQ ID NO: 327 is the amino acid sequence for clone #19110.
20 SEQ ID NO: 328 is the amino acid sequence for clone #19122.
SEQ ID NO: 329 is the amino acid sequence for clone #19118.
SEQ ID NO: 330 is the amino acid sequence for clone #19080.
SEQ ID NO: 331 is the amino acid sequence for clone #19127.
SEQ ID NO: 332 is the amino acid sequence for clone #19117.
25 SEQ ID NO: 333 is the amino acid sequence for clone #19095, also
referred to L549S.
SEQ ID NO: 334 is the amino acid sequence for clone #18964.
SEQ ID NO: 335 is the amino acid sequence for clone #18929.
SEQ ID NO: 336 is the amino acid sequence for clone #18991.
30 SEQ ID NO: 337 is the amino acid sequence for clone #18996.
SEQ ID NO: 338 is the amino acid sequence for clone #18966.

SEQ ID NO: 339 is the amino acid sequence for clone #18951.
SEQ ID NO: 340 is the amino acid sequence for clone #18973.
SEQ ID NO: 341 is the determined cDNA sequence for clone 26461.
SEQ ID NO: 342 is the determined cDNA sequence for clone 26462.
5 SEQ ID NO: 343 is the determined cDNA sequence for clone 26463.
SEQ ID NO: 344 is the determined cDNA sequence for clone 26464.
SEQ ID NO: 345 is the determined cDNA sequence for clone 26465.
SEQ ID NO: 346 is the determined cDNA sequence for clone 26466.
SEQ ID NO: 347 is the determined cDNA sequence for clone 26467.
10 SEQ ID NO: 348 is the determined cDNA sequence for clone 26468.
SEQ ID NO: 349 is the determined cDNA sequence for clone 26469.
SEQ ID NO: 350 is the determined cDNA sequence for clone 26470.
SEQ ID NO: 351 is the determined cDNA sequence for clone 26471.
SEQ ID NO: 352 is the determined cDNA sequence for clone 26472.
15 SEQ ID NO: 353 is the determined cDNA sequence for clone 26474.
SEQ ID NO: 354 is the determined cDNA sequence for clone 26475.
SEQ ID NO: 355 is the determined cDNA sequence for clone 26476.
SEQ ID NO: 356 is the determined cDNA sequence for clone 26477.
SEQ ID NO: 357 is the determined cDNA sequence for clone 26478.
20 SEQ ID NO: 358 is the determined cDNA sequence for clone 26479.
SEQ ID NO: 359 is the determined cDNA sequence for clone 26480.
SEQ ID NO: 360 is the determined cDNA sequence for clone 26481.
SEQ ID NO: 361 is the determined cDNA sequence for clone 26482.
SEQ ID NO: 362 is the determined cDNA sequence for clone 26483.
25 SEQ ID NO: 363 is the determined cDNA sequence for clone 26484.
SEQ ID NO: 364 is the determined cDNA sequence for clone 26485.
SEQ ID NO: 365 is the determined cDNA sequence for clone 26486.
SEQ ID NO: 366 is the determined cDNA sequence for clone 26487.
SEQ ID NO: 367 is the determined cDNA sequence for clone 26488.
30 SEQ ID NO: 368 is the determined cDNA sequence for clone 26489.
SEQ ID NO: 369 is the determined cDNA sequence for clone 26490.

SEQ ID NO: 370 is the determined cDNA sequence for clone 26491.
SEQ ID NO: 371 is the determined cDNA sequence for clone 26492.
SEQ ID NO: 372 is the determined cDNA sequence for clone 26493.
SEQ ID NO: 373 is the determined cDNA sequence for clone 26494.
5 SEQ ID NO: 374 is the determined cDNA sequence for clone 26495.
SEQ ID NO: 375 is the determined cDNA sequence for clone 26496.
SEQ ID NO: 376 is the determined cDNA sequence for clone 26497.
SEQ ID NO: 377 is the determined cDNA sequence for clone 26498.
SEQ ID NO: 378 is the determined cDNA sequence for clone 26499.
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SEQ ID NO: 380 is the determined cDNA sequence for clone 26501.
SEQ ID NO: 381 is the determined cDNA sequence for clone 26502.
SEQ ID NO: 382 is the determined cDNA sequence for clone 26503.
SEQ ID NO: 383 is the determined cDNA sequence for clone 26504.
15 SEQ ID NO: 384 is the determined cDNA sequence for clone 26505.
SEQ ID NO: 385 is the determined cDNA sequence for clone 26506.
SEQ ID NO: 386 is the determined cDNA sequence for clone 26507.
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SEQ ID NO: 388 is the determined cDNA sequence for clone 26509.
20 SEQ ID NO: 389 is the determined cDNA sequence for clone 26511.
SEQ ID NO: 390 is the determined cDNA sequence for clone 26513.
SEQ ID NO: 391 is the determined cDNA sequence for clone 26514.
SEQ ID NO: 392 is the determined cDNA sequence for clone 26515.
SEQ ID NO: 393 is the determined cDNA sequence for clone 26516.
25 SEQ ID NO: 394 is the determined cDNA sequence for clone 26517.
SEQ ID NO: 395 is the determined cDNA sequence for clone 26518.
SEQ ID NO: 396 is the determined cDNA sequence for clone 26519.
SEQ ID NO: 397 is the determined cDNA sequence for clone 26520.
SEQ ID NO: 398 is the determined cDNA sequence for clone 26521.
30 SEQ ID NO: 399 is the determined cDNA sequence for clone 26522.
SEQ ID NO: 400 is the determined cDNA sequence for clone 26523.

SEQ ID NO: 401 is the determined cDNA sequence for clone 26524.
SEQ ID NO: 402 is the determined cDNA sequence for clone 26526.
SEQ ID NO: 403 is the determined cDNA sequence for clone 26527.
SEQ ID NO: 404 is the determined cDNA sequence for clone 26528.
5 SEQ ID NO: 405 is the determined cDNA sequence for clone 26529.
SEQ ID NO: 406 is the determined cDNA sequence for clone 26530.
SEQ ID NO: 407 is the determined cDNA sequence for clone 26532.
SEQ ID NO: 408 is the determined cDNA sequence for clone 26533.
SEQ ID NO: 409 is the determined cDNA sequence for clone 26534.
10 SEQ ID NO: 410 is the determined cDNA sequence for clone 26535.
SEQ ID NO: 411 is the determined cDNA sequence for clone 26536.
SEQ ID NO: 412 is the determined cDNA sequence for clone 26537.
SEQ ID NO: 413 is the determined cDNA sequence for clone 26538.
SEQ ID NO: 414 is the determined cDNA sequence for clone 26540.
15 SEQ ID NO: 415 is the determined cDNA sequence for clone 26541.
SEQ ID NO: 416 is the determined cDNA sequence for clone 26542.
SEQ ID NO: 417 is the determined cDNA sequence for clone 26543.
SEQ ID NO: 418 is the determined cDNA sequence for clone 26544.
SEQ ID NO: 419 is the determined cDNA sequence for clone 26546.
20 SEQ ID NO: 420 is the determined cDNA sequence for clone 26547.
SEQ ID NO: 421 is the determined cDNA sequence for clone 26548.
SEQ ID NO: 422 is the determined cDNA sequence for clone 26549.
SEQ ID NO: 423 is the determined cDNA sequence for clone 26550.
SEQ ID NO: 424 is the determined cDNA sequence for clone 26551.
25 SEQ ID NO: 425 is the determined cDNA sequence for clone 26552.
SEQ ID NO: 426 is the determined cDNA sequence for clone 26553.
SEQ ID NO: 427 is the determined cDNA sequence for clone 26554.
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SEQ ID NO: 429 is the determined cDNA sequence for clone 26557.
30 SEQ ID NO: 430 is the determined cDNA sequence for clone 27631.
SEQ ID NO: 431 is the determined cDNA sequence for clone 27632.

SEQ ID NO: 432 is the determined cDNA sequence for clone 27633.
SEQ ID NO: 433 is the determined cDNA sequence for clone 27635.
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SEQ ID NO: 435 is the determined cDNA sequence for clone 27637.
5 SEQ ID NO: 436 is the determined cDNA sequence for clone 27638.
SEQ ID NO: 437 is the determined cDNA sequence for clone 27639.
SEQ ID NO: 438 is the determined cDNA sequence for clone 27640.
SEQ ID NO: 439 is the determined cDNA sequence for clone 27641.
SEQ ID NO: 440 is the determined cDNA sequence for clone 27642.
10 SEQ ID NO: 441 is the determined cDNA sequence for clone 27644.
SEQ ID NO: 442 is the determined cDNA sequence for clone 27646.
SEQ ID NO: 443 is the determined cDNA sequence for clone 27647.
SEQ ID NO: 444 is the determined cDNA sequence for clone 27649.
SEQ ID NO: 445 is the determined cDNA sequence for clone 27650.
15 SEQ ID NO: 446 is the determined cDNA sequence for clone 27651.
SEQ ID NO: 447 is the determined cDNA sequence for clone 27652.
SEQ ID NO: 448 is the determined cDNA sequence for clone 27654.
SEQ ID NO: 449 is the determined cDNA sequence for clone 27655.
SEQ ID NO: 450 is the determined cDNA sequence for clone 27657.
20 SEQ ID NO: 451 is the determined cDNA sequence for clone 27659.
SEQ ID NO: 452 is the determined cDNA sequence for clone 27665.
SEQ ID NO: 453 is the determined cDNA sequence for clone 27666.
SEQ ID NO: 454 is the determined cDNA sequence for clone 27668.
SEQ ID NO: 455 is the determined cDNA sequence for clone 27670.
25 SEQ ID NO: 456 is the determined cDNA sequence for clone 27671.
SEQ ID NO: 457 is the determined cDNA sequence for clone 27672.
SEQ ID NO: 458 is the determined cDNA sequence for clone 27674.
SEQ ID NO: 459 is the determined cDNA sequence for clone 27677.
SEQ ID NO: 460 is the determined cDNA sequence for clone 27681.
30 SEQ ID NO: 461 is the determined cDNA sequence for clone 27682.
SEQ ID NO: 462 is the determined cDNA sequence for clone 27683.

SEQ ID NO: 463 is the determined cDNA sequence for clone 27686.
SEQ ID NO: 464 is the determined cDNA sequence for clone 27688.
SEQ ID NO: 465 is the determined cDNA sequence for clone 27689.
SEQ ID NO: 466 is the determined cDNA sequence for clone 27690.
5 SEQ ID NO: 467 is the determined cDNA sequence for clone 27693.
SEQ ID NO: 468 is the determined cDNA sequence for clone 27699.
SEQ ID NO: 469 is the determined cDNA sequence for clone 27700.
SEQ ID NO: 470 is the determined cDNA sequence for clone 27702.
SEQ ID NO: 471 is the determined cDNA sequence for clone 27705.
10 SEQ ID NO: 472 is the determined cDNA sequence for clone 27706.
SEQ ID NO: 473 is the determined cDNA sequence for clone 27707.
SEQ ID NO: 474 is the determined cDNA sequence for clone 27708.
SEQ ID NO: 475 is the determined cDNA sequence for clone 27709.
SEQ ID NO: 476 is the determined cDNA sequence for clone 27710.
15 SEQ ID NO: 477 is the determined cDNA sequence for clone 27711.
SEQ ID NO: 478 is the determined cDNA sequence for clone 27712.
SEQ ID NO: 479 is the determined cDNA sequence for clone 27713.
SEQ ID NO: 480 is the determined cDNA sequence for clone 27714.
SEQ ID NO: 481 is the determined cDNA sequence for clone 27715.
20 SEQ ID NO: 482 is the determined cDNA sequence for clone 27716.
SEQ ID NO: 483 is the determined cDNA sequence for clone 27717.
SEQ ID NO: 484 is the determined cDNA sequence for clone 27718.
SEQ ID NO: 485 is the determined cDNA sequence for clone 27719.
SEQ ID NO: 486 is the determined cDNA sequence for clone 27720.
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SEQ ID NO: 488 is the determined cDNA sequence for clone 27723.
SEQ ID NO: 489 is the determined cDNA sequence for clone 27724.
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SEQ ID NO: 491 is the determined cDNA sequence for clone 25015.
30 SEQ ID NO: 492 is the determined cDNA sequence for clone 25016.
SEQ ID NO: 493 is the determined cDNA sequence for clone 25017.

SEQ ID NO: 494 is the determined cDNA sequence for clone 25018
SEQ ID NO: 495 is the determined cDNA sequence for clone 25030.
SEQ ID NO: 496 is the determined cDNA sequence for clone 25033.
SEQ ID NO: 497 is the determined cDNA sequence for clone 25034.
5 SEQ ID NO: 498 is the determined cDNA sequence for clone 25035.
SEQ ID NO: 499 is the determined cDNA sequence for clone 25036.
SEQ ID NO: 500 is the determined cDNA sequence for clone 25037.
SEQ ID NO: 501 is the determined cDNA sequence for clone 25038.
SEQ ID NO: 502 is the determined cDNA sequence for clone 25039.
10 SEQ ID NO: 503 is the determined cDNA sequence for clone 25040.
SEQ ID NO: 504 is the determined cDNA sequence for clone 25042.
SEQ ID NO: 505 is the determined cDNA sequence for clone 25043.
SEQ ID NO: 506 is the determined cDNA sequence for clone 25044.
SEQ ID NO: 507 is the determined cDNA sequence for clone 25045.
15 SEQ ID NO: 508 is the determined cDNA sequence for clone 25047.
SEQ ID NO: 509 is the determined cDNA sequence for clone 25048.
SEQ ID NO: 510 is the determined cDNA sequence for clone 25049.
SEQ ID NO: 511 is the determined cDNA sequence for clone 25185.
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20 SEQ ID NO: 513 is the determined cDNA sequence for clone 25187.
SEQ ID NO: 514 is the determined cDNA sequence for clone 25188.
SEQ ID NO: 515 is the determined cDNA sequence for clone 25189.
SEQ ID NO: 516 is the determined cDNA sequence for clone 25190.
SEQ ID NO: 517 is the determined cDNA sequence for clone 25193.
25 SEQ ID NO: 518 is the determined cDNA sequence for clone 25194.
SEQ ID NO: 519 is the determined cDNA sequence for clone 25196.
SEQ ID NO: 520 is the determined cDNA sequence for clone 25198.
SEQ ID NO: 521 is the determined cDNA sequence for clone 25199.
SEQ ID NO: 522 is the determined cDNA sequence for clone 25200.
30 SEQ ID NO: 523 is the determined cDNA sequence for clone 25202.
SEQ ID NO: 524 is the determined cDNA sequence for clone 25364.

SEQ ID NO: 525 is the determined cDNA sequence for clone 25366.
SEQ ID NO: 526 is the determined cDNA sequence for clone 25367.
SEQ ID NO: 527 is the determined cDNA sequence for clone 25368.
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SEQ ID NO: 530 is the determined cDNA sequence for clone 25371.
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10 SEQ ID NO: 534 is the determined cDNA sequence for clone 25376.
SEQ ID NO: 535 is the determined cDNA sequence for clone 25377.
SEQ ID NO: 536 is the determined cDNA sequence for clone 25378.
SEQ ID NO: 537 is the determined cDNA sequence for clone 25379.
SEQ ID NO: 538 is the determined cDNA sequence for clone 25380.
15 SEQ ID NO: 539 is the determined cDNA sequence for clone 25381.
SEQ ID NO: 540 is the determined cDNA sequence for clone 25382.
SEQ ID NO: 541 is the determined cDNA sequence for clone 25383.
SEQ ID NO: 542 is the determined cDNA sequence for clone 25385.
SEQ ID NO: 543 is the determined cDNA sequence for clone 25386.
20 SEQ ID NO: 544 is the determined cDNA sequence for clone 25387.
SEQ ID NO: 545 is the determined cDNA sequence for clone 26013.
SEQ ID NO: 546 is the determined cDNA sequence for clone 26014.
SEQ ID NO: 547 is the determined cDNA sequence for clone 26016.
SEQ ID NO: 548 is the determined cDNA sequence for clone 26017.
25 SEQ ID NO: 549 is the determined cDNA sequence for clone 26018.
SEQ ID NO: 550 is the determined cDNA sequence for clone 26019.
SEQ ID NO: 551 is the determined cDNA sequence for clone 26020.
SEQ ID NO: 552 is the determined cDNA sequence for clone 26021.
SEQ ID NO: 553 is the determined cDNA sequence for clone 26022.
30 SEQ ID NO: 554 is the determined cDNA sequence for clone 26027.
SEQ ID NO: 555 is the determined cDNA sequence for clone 26197.

SEQ ID NO: 556 is the determined cDNA sequence for clone 26199.
SEQ ID NO: 557 is the determined cDNA sequence for clone 26201.
SEQ ID NO: 558 is the determined cDNA sequence for clone 26202.
SEQ ID NO: 559 is the determined cDNA sequence for clone 26203.
5 SEQ ID NO: 560 is the determined cDNA sequence for clone 26204.
SEQ ID NO: 561 is the determined cDNA sequence for clone 26205.
SEQ ID NO: 562 is the determined cDNA sequence for clone 26206.
SEQ ID NO: 563 is the determined cDNA sequence for clone 26208.
SEQ ID NO: 564 is the determined cDNA sequence for clone 26211.
10 SEQ ID NO: 565 is the determined cDNA sequence for clone 26212.
SEQ ID NO: 566 is the determined cDNA sequence for clone 26213.
SEQ ID NO: 567 is the determined cDNA sequence for clone 26214.
SEQ ID NO: 568 is the determined cDNA sequence for clone 26215.
SEQ ID NO: 569 is the determined cDNA sequence for clone 26216.
15 SEQ ID NO: 570 is the determined cDNA sequence for clone 26217.
SEQ ID NO: 571 is the determined cDNA sequence for clone 26218.
SEQ ID NO: 572 is the determined cDNA sequence for clone 26219.
SEQ ID NO: 573 is the determined cDNA sequence for clone 26220.
SEQ ID NO: 574 is the determined cDNA sequence for clone 26221.
20 SEQ ID NO: 575 is the determined cDNA sequence for clone 26224.
SEQ ID NO: 576 is the determined cDNA sequence for clone 26225.
SEQ ID NO: 577 is the determined cDNA sequence for clone 26226.
SEQ ID NO: 578 is the determined cDNA sequence for clone 26227.
SEQ ID NO: 579 is the determined cDNA sequence for clone 26228.
25 SEQ ID NO: 580 is the determined cDNA sequence for clone 26230.
SEQ ID NO: 581 is the determined cDNA sequence for clone 26231.
SEQ ID NO: 582 is the determined cDNA sequence for clone 26234.
SEQ ID NO: 583 is the determined cDNA sequence for clone 26236.
SEQ ID NO: 584 is the determined cDNA sequence for clone 26237.
30 SEQ ID NO: 585 is the determined cDNA sequence for clone 26239.
SEQ ID NO: 586 is the determined cDNA sequence for clone 26240.

SEQ ID NO: 587 is the determined cDNA sequence for clone 26241.
SEQ ID NO: 588 is the determined cDNA sequence for clone 26242.
SEQ ID NO: 589 is the determined cDNA sequence for clone 26246.
SEQ ID NO: 590 is the determined cDNA sequence for clone 26247.
5 SEQ ID NO: 591 is the determined cDNA sequence for clone 26248.
SEQ ID NO: 592 is the determined cDNA sequence for clone 26249.
SEQ ID NO: 593 is the determined cDNA sequence for clone 26250.
SEQ ID NO: 594 is the determined cDNA sequence for clone 26251.
SEQ ID NO: 595 is the determined cDNA sequence for clone 26252.
10 SEQ ID NO: 596 is the determined cDNA sequence for clone 26253.
SEQ ID NO: 597 is the determined cDNA sequence for clone 26254.
SEQ ID NO: 598 is the determined cDNA sequence for clone 26255.
SEQ ID NO: 599 is the determined cDNA sequence for clone 26256.
SEQ ID NO: 600 is the determined cDNA sequence for clone 26257.
15 SEQ ID NO: 601 is the determined cDNA sequence for clone 26259.
SEQ ID NO: 602 is the determined cDNA sequence for clone 26260.
SEQ ID NO: 603 is the determined cDNA sequence for clone 26261.
SEQ ID NO: 604 is the determined cDNA sequence for clone 26262.
SEQ ID NO: 605 is the determined cDNA sequence for clone 26263.
20 SEQ ID NO: 606 is the determined cDNA sequence for clone 26264.
SEQ ID NO: 607 is the determined cDNA sequence for clone 26265.
SEQ ID NO: 608 is the determined cDNA sequence for clone 26266.
SEQ ID NO: 609 is the determined cDNA sequence for clone 26268.
SEQ ID NO: 610 is the determined cDNA sequence for clone 26269.
25 SEQ ID NO: 611 is the determined cDNA sequence for clone 26271.
SEQ ID NO: 612 is the determined cDNA sequence for clone 26273.
SEQ ID NO: 613 is the determined cDNA sequence for clone 26810.
SEQ ID NO: 614 is the determined cDNA sequence for clone 26811.
SEQ ID NO: 615 is the determined cDNA sequence for clone 26812.1.
30 SEQ ID NO: 616 is the determined cDNA sequence for clone 26812.2.
SEQ ID NO: 617 is the determined cDNA sequence for clone 26813.

SEQ ID NO: 618 is the determined cDNA sequence for clone 26814.
SEQ ID NO: 619 is the determined cDNA sequence for clone 26815.
SEQ ID NO: 620 is the determined cDNA sequence for clone 26816.
SEQ ID NO: 621 is the determined cDNA sequence for clone 26818.
5 SEQ ID NO: 622 is the determined cDNA sequence for clone 26819.
SEQ ID NO: 623 is the determined cDNA sequence for clone 26820.
SEQ ID NO: 624 is the determined cDNA sequence for clone 26821.
SEQ ID NO: 625 is the determined cDNA sequence for clone 26822.
SEQ ID NO: 626 is the determined cDNA sequence for clone 26824.
10 SEQ ID NO: 627 is the determined cDNA sequence for clone 26825.
SEQ ID NO: 628 is the determined cDNA sequence for clone 26826.
SEQ ID NO: 629 is the determined cDNA sequence for clone 26827.
SEQ ID NO: 630 is the determined cDNA sequence for clone 26829.
SEQ ID NO: 631 is the determined cDNA sequence for clone 26830.
15 SEQ ID NO: 632 is the determined cDNA sequence for clone 26831.
SEQ ID NO: 633 is the determined cDNA sequence for clone 26832.
SEQ ID NO: 634 is the determined cDNA sequence for clone 26835.
SEQ ID NO: 635 is the determined cDNA sequence for clone 26836.
SEQ ID NO: 636 is the determined cDNA sequence for clone 26837.
20 SEQ ID NO: 637 is the determined cDNA sequence for clone 26839.
SEQ ID NO: 638 is the determined cDNA sequence for clone 26841.
SEQ ID NO: 639 is the determined cDNA sequence for clone 26843.
SEQ ID NO: 640 is the determined cDNA sequence for clone 26844.
SEQ ID NO: 641 is the determined cDNA sequence for clone 26845.
25 SEQ ID NO: 642 is the determined cDNA sequence for clone 26846.
SEQ ID NO: 643 is the determined cDNA sequence for clone 26847.
SEQ ID NO: 644 is the determined cDNA sequence for clone 26848.
SEQ ID NO: 645 is the determined cDNA sequence for clone 26849.
SEQ ID NO: 646 is the determined cDNA sequence for clone 26850.
30 SEQ ID NO: 647 is the determined cDNA sequence for clone 26851.
SEQ ID NO: 648 is the determined cDNA sequence for clone 26852.

SEQ ID NO: 649 is the determined cDNA sequence for clone 26853.
SEQ ID NO: 650 is the determined cDNA sequence for clone 26854.
SEQ ID NO: 651 is the determined cDNA sequence for clone 26856.
SEQ ID NO: 652 is the determined cDNA sequence for clone 26857.
5 SEQ ID NO: 653 is the determined cDNA sequence for clone 26858.
SEQ ID NO: 654 is the determined cDNA sequence for clone 26859.
SEQ ID NO: 655 is the determined cDNA sequence for clone 26860.
SEQ ID NO: 656 is the determined cDNA sequence for clone 26862.
SEQ ID NO: 657 is the determined cDNA sequence for clone 26863.
10 SEQ ID NO: 658 is the determined cDNA sequence for clone 26864.
SEQ ID NO: 659 is the determined cDNA sequence for clone 26865.
SEQ ID NO: 660 is the determined cDNA sequence for clone 26867.
SEQ ID NO: 661 is the determined cDNA sequence for clone 26868.
SEQ ID NO: 662 is the determined cDNA sequence for clone 26871.
15 SEQ ID NO: 663 is the determined cDNA sequence for clone 26873.
SEQ ID NO: 664 is the determined cDNA sequence for clone 26875.
SEQ ID NO: 665 is the determined cDNA sequence for clone 26876.
SEQ ID NO: 666 is the determined cDNA sequence for clone 26877.
SEQ ID NO: 667 is the determined cDNA sequence for clone 26878.
20 SEQ ID NO: 668 is the determined cDNA sequence for clone 26880.
SEQ ID NO: 669 is the determined cDNA sequence for clone 26882.
SEQ ID NO: 670 is the determined cDNA sequence for clone 26883.
SEQ ID NO: 671 is the determined cDNA sequence for clone 26884.
SEQ ID NO: 672 is the determined cDNA sequence for clone 26885.
25 SEQ ID NO: 673 is the determined cDNA sequence for clone 26886.
SEQ ID NO: 674 is the determined cDNA sequence for clone 26887.
SEQ ID NO: 675 is the determined cDNA sequence for clone 26888.
SEQ ID NO: 676 is the determined cDNA sequence for clone 26889.
SEQ ID NO: 677 is the determined cDNA sequence for clone 26890.
30 SEQ ID NO: 678 is the determined cDNA sequence for clone 26892.
SEQ ID NO: 679 is the determined cDNA sequence for clone 26894.

SEQ ID NO: 680 is the determined cDNA sequence for clone 26895.
SEQ ID NO: 681 is the determined cDNA sequence for clone 26897.
SEQ ID NO: 682 is the determined cDNA sequence for clone 26898.
SEQ ID NO: 683 is the determined cDNA sequence for clone 26899.
5 SEQ ID NO: 684 is the determined cDNA sequence for clone 26900.
SEQ ID NO: 685 is the determined cDNA sequence for clone 26901.
SEQ ID NO: 686 is the determined cDNA sequence for clone 26903.
SEQ ID NO: 687 is the determined cDNA sequence for clone 26905.
SEQ ID NO: 688 is the determined cDNA sequence for clone 26906.
10 SEQ ID NO: 689 is the determined cDNA sequence for clone 26708.
SEQ ID NO: 690 is the determined cDNA sequence for clone 26709.
SEQ ID NO: 691 is the determined cDNA sequence for clone 26710.
SEQ ID NO: 692 is the determined cDNA sequence for clone 26711.
SEQ ID NO: 693 is the determined cDNA sequence for clone 26712.
15 SEQ ID NO: 694 is the determined cDNA sequence for clone 26713.
SEQ ID NO: 695 is the determined cDNA sequence for clone 26714.
SEQ ID NO: 696 is the determined cDNA sequence for clone 26715.
SEQ ID NO: 697 is the determined cDNA sequence for clone 26716.
SEQ ID NO: 698 is the determined cDNA sequence for clone 26717.
20 SEQ ID NO: 699 is the determined cDNA sequence for clone 26718.
SEQ ID NO: 700 is the determined cDNA sequence for clone 26719.
SEQ ID NO: 701 is the determined cDNA sequence for clone 26720.
SEQ ID NO: 702 is the determined cDNA sequence for clone 26721.
SEQ ID NO: 703 is the determined cDNA sequence for clone 26722.
25 SEQ ID NO: 704 is the determined cDNA sequence for clone 26723.
SEQ ID NO: 705 is the determined cDNA sequence for clone 26724.
SEQ ID NO: 706 is the determined cDNA sequence for clone 26725.
SEQ ID NO: 707 is the determined cDNA sequence for clone 26726.
SEQ ID NO: 708 is the determined cDNA sequence for clone 26727.
30 SEQ ID NO: 709 is the determined cDNA sequence for clone 26728.
SEQ ID NO: 710 is the determined cDNA sequence for clone 26729.

SEQ ID NO: 711 is the determined cDNA sequence for clone 26730.
SEQ ID NO: 712 is the determined cDNA sequence for clone 26731.
SEQ ID NO: 713 is the determined cDNA sequence for clone 26732.
SEQ ID NO: 714 is the determined cDNA sequence for clone 26733.1.
5 SEQ ID NO: 715 is the determined cDNA sequence for clone 26733.2.
SEQ ID NO: 716 is the determined cDNA sequence for clone 26734.
SEQ ID NO: 717 is the determined cDNA sequence for clone 26735.
SEQ ID NO: 718 is the determined cDNA sequence for clone 26736.
SEQ ID NO: 719 is the determined cDNA sequence for clone 26737.
10 SEQ ID NO: 720 is the determined cDNA sequence for clone 26738.
SEQ ID NO: 721 is the determined cDNA sequence for clone 26739.
SEQ ID NO: 722 is the determined cDNA sequence for clone 26741.
SEQ ID NO: 723 is the determined cDNA sequence for clone 26742.
SEQ ID NO: 724 is the determined cDNA sequence for clone 26743.
15 SEQ ID NO: 725 is the determined cDNA sequence for clone 26744.
SEQ ID NO: 726 is the determined cDNA sequence for clone 26745.
SEQ ID NO: 727 is the determined cDNA sequence for clone 26746.
SEQ ID NO: 728 is the determined cDNA sequence for clone 26747.
SEQ ID NO: 729 is the determined cDNA sequence for clone 26748.
20 SEQ ID NO: 730 is the determined cDNA sequence for clone 26749.
SEQ ID NO: 731 is the determined cDNA sequence for clone 26750.
SEQ ID NO: 732 is the determined cDNA sequence for clone 26751.
SEQ ID NO: 733 is the determined cDNA sequence for clone 26752.
SEQ ID NO: 734 is the determined cDNA sequence for clone 26753.
25 SEQ ID NO: 735 is the determined cDNA sequence for clone 26754.
SEQ ID NO: 736 is the determined cDNA sequence for clone 26755.
SEQ ID NO: 737 is the determined cDNA sequence for clone 26756.
SEQ ID NO: 738 is the determined cDNA sequence for clone 26757.
SEQ ID NO: 739 is the determined cDNA sequence for clone 26758.
30 SEQ ID NO: 740 is the determined cDNA sequence for clone 26759.
SEQ ID NO: 741 is the determined cDNA sequence for clone 26760.

SEQ ID NO: 742 is the determined cDNA sequence for clone 26761.
SEQ ID NO: 743 is the determined cDNA sequence for clone 26762.
SEQ ID NO: 744 is the determined cDNA sequence for clone 26763.
SEQ ID NO: 745 is the determined cDNA sequence for clone 26764.
5 SEQ ID NO: 746 is the determined cDNA sequence for clone 26765.
SEQ ID NO: 747 is the determined cDNA sequence for clone 26766.
SEQ ID NO: 748 is the determined cDNA sequence for clone 26767.
SEQ ID NO: 749 is the determined cDNA sequence for clone 26768.
SEQ ID NO: 750 is the determined cDNA sequence for clone 26769.
10 SEQ ID NO: 751 is the determined cDNA sequence for clone 26770.
SEQ ID NO: 752 is the determined cDNA sequence for clone 26771.
SEQ ID NO: 753 is the determined cDNA sequence for clone 26772.
SEQ ID NO: 754 is the determined cDNA sequence for clone 26773.
SEQ ID NO: 755 is the determined cDNA sequence for clone 26774.
15 SEQ ID NO: 756 is the determined cDNA sequence for clone 26775.
SEQ ID NO: 757 is the determined cDNA sequence for clone 26776.
SEQ ID NO: 758 is the determined cDNA sequence for clone 26777.
SEQ ID NO: 759 is the determined cDNA sequence for clone 26778.
SEQ ID NO: 760 is the determined cDNA sequence for clone 26779.
20 SEQ ID NO: 761 is the determined cDNA sequence for clone 26781.
SEQ ID NO: 762 is the determined cDNA sequence for clone 26782.
SEQ ID NO: 763 is the determined cDNA sequence for clone 26783.
SEQ ID NO: 764 is the determined cDNA sequence for clone 26784.
SEQ ID NO: 765 is the determined cDNA sequence for clone 26785.
25 SEQ ID NO: 766 is the determined cDNA sequence for clone 26786.
SEQ ID NO: 767 is the determined cDNA sequence for clone 26787.
SEQ ID NO: 768 is the determined cDNA sequence for clone 26788.
SEQ ID NO: 769 is the determined cDNA sequence for clone 26790.
SEQ ID NO: 770 is the determined cDNA sequence for clone 26791.
30 SEQ ID NO: 771 is the determined cDNA sequence for clone 26792.
SEQ ID NO: 772 is the determined cDNA sequence for clone 26793.

SEQ ID NO: 773 is the determined cDNA sequence for clone 26794.
SEQ ID NO: 774 is the determined cDNA sequence for clone 26795.
SEQ ID NO: 775 is the determined cDNA sequence for clone 26796.
SEQ ID NO: 776 is the determined cDNA sequence for clone 26797.
5 SEQ ID NO: 777 is the determined cDNA sequence for clone 26798.
SEQ ID NO: 778 is the determined cDNA sequence for clone 26800.
SEQ ID NO: 779 is the determined cDNA sequence for clone 26801.
SEQ ID NO: 780 is the determined cDNA sequence for clone 26802.
SEQ ID NO: 781 is the determined cDNA sequence for clone 26803.
10 SEQ ID NO: 782 is the determined cDNA sequence for clone 26804.
SEQ ID NO: 783 is the amino acid sequence for L773P.
SEQ ID NO: 784 is the determined DNA sequence of the L773P
expression construct.
SEQ ID NO: 785 is the determined DNA sequence of the L773PA
15 expression construct.
SEQ ID NO: 786 is a predicted amino acid sequence for L552S.
SEQ ID NO: 787 is a predicted amino acid sequence for L840P.
SEQ ID NO: 788 is the full-length cDNA sequence for L548S.
SEQ ID NO: 789 is the amino acid sequence encoded by SEQ ID NO:
20 788.
SEQ ID NO: 790 is an extended cDNA sequence for L552S.
SEQ ID NO: 791 is the predicted amino acid sequence encoded by the
cDNA sequence of SEQ ID NO: 790.
SEQ ID NO: 792 is the determined cDNA sequence for an isoform of
25 L552S.
SEQ ID NO: 793 is the predicted amino acid sequence encoded by SEQ
ID NO: 792.
SEQ ID NO: 794 is an extended cDNA sequence for L840P.
SEQ ID NO: 795 is the predicted amino acid sequence encoded by SEQ
30 DI NO: 794.
SEQ ID NO: 796 is an extended cDNA sequence for L801P.

SEQ ID NO: 797 is a first predicted amino acid sequence encoded by
SEQ ID NO: 796.

SEQ ID NO: 798 is a second predicted amino acid sequence encoded by
SEQ ID NO: 796.

5 SEQ ID NO: 799 is a third predicted amino acid sequence encoded by
SEQ ID NO: 796.

SEQ ID NO: 800 is the determined full-length sequence for L844P.

SEQ ID NO: 801 is the 5' consensus cDNA sequence for L551S.

SEQ ID NO: 802 is the 3' consensus cDNA sequence for L551S.

10 SEQ ID NO: 803 is the cDNA sequence for STY8.

SEQ ID NO: 804 is an extended cDNA sequence for L551S.

SEQ ID NO: 805 is the amino acid sequence for STY8.

SEQ ID NO: 806 is the extended amino acid sequence for L551S.

15 SEQ ID NO: 807 is the determined full-length cDNA sequence for
L773P.

SEQ ID NO: 808 is the full-length cDNA sequence of L552S.

SEQ ID NO: 809 is the full-length amino acid sequence of L552S.

SEQ ID NO: 810 is the determined cDNA sequence of clone 50989.

SEQ ID NO: 811 is the determined cDNA sequence of clone 50990.

20 SEQ ID NO: 812 is the determined cDNA sequence of clone 50992.

SEQ ID NO: 813-824 are the determined cDNA sequences for clones
isolated from lung tumor tissue.

SEQ ID NO: 825 is the determined cDNA sequence for the full-length
L551S clone 54305.

25 SEQ ID NO: 826 is the determined cDNA sequence for the full-length
L551S clone 54298.

SEQ ID NO: 827 is the full-length amino acid sequence for L551S.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for using the compositions, for example in the therapy and diagnosis of cancer, such as lung cancer. Certain illustrative compositions described herein include lung tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). A "lung tumor protein," as the term is used herein, refers generally to a protein that is expressed in lung tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain lung tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with lung cancer.

Therefore, in accordance with the above, and as described further below, the present invention provides illustrative polynucleotide compositions having sequences set forth in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826, illustrative polypeptide compositions having amino acid sequences set forth in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827, antibody compositions capable of binding such polypeptides, and numerous additional embodiments employing such compositions, for example in the detection, diagnosis and/or therapy of human lung cancer.

POLYNUCLEOTIDE COMPOSITIONS

As used herein, the terms "DNA segment" and "polynucleotide" refer to a DNA molecule that has been isolated free of total genomic DNA of a particular species. Therefore, a DNA segment encoding a polypeptide refers to a DNA segment that contains one or more coding sequences yet is substantially isolated away from, or

purified free from, total genomic DNA of the species from which the DNA segment is obtained. Included within the terms "DNA segment" and "polynucleotide" are DNA segments and smaller fragments of such segments, and also recombinant vectors, including, for example, plasmids, cosmids, phagemids, phage, viruses, and the like.

5 As will be understood by those skilled in the art, the DNA segments of this invention can include genomic sequences, extra-genomic and plasmid-encoded sequences and smaller engineered gene segments that express, or may be adapted to express, proteins, polypeptides, peptides and the like. Such segments may be naturally isolated, or modified synthetically by the hand of man.

10 "Isolated," as used herein, means that a polynucleotide is substantially away from other coding sequences, and that the DNA segment does not contain large portions of unrelated coding DNA, such as large chromosomal fragments or other functional genes or polypeptide coding regions. Of course, this refers to the DNA segment as originally isolated, and does not exclude genes or coding regions later added
15 to the segment by the hand of man.

 As will be recognized by the skilled artisan, polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and
20 mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

 Polynucleotides may comprise a native sequence (*i.e.*, an endogenous
25 sequence that encodes a lung tumor protein or a portion thereof) or may comprise a variant, or a biological or antigenic functional equivalent of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions, as further described below, preferably such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The
30 effect on the immunogenicity of the encoded polypeptide may generally be assessed as

described herein. The term “variants” also encompasses homologous genes of xenogenic origin.

When comparing polynucleotide or polypeptide sequences, two sequences are said to be “identical” if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence, as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A “comparison window” as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) *Atlas of Protein Sequence and Structure*, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenies pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad. Sci. USA* 80:726-730.

Alternatively, optimal alignment of sequences for comparison may be conducted by the local identity algorithm of Smith and Waterman (1981) *Add. APL. Math* 2:482, by the identity alignment algorithm of Needleman and Wunsch (1970) *J. Mol. Biol.* 48:443, by the search for similarity methods of Pearson and Lipman (1988) *Proc. Natl. Acad. Sci. USA* 85: 2444, by computerized implementations of these algorithms (GAP, BESTFIT, BLAST, FASTA, and TFASTA in the Wisconsin Genetics

Software Package, Genetics Computer Group (GCG), 575 Science Dr., Madison, WI), or by inspection.

One preferred example of algorithms that are suitable for determining percent sequence identity and sequence similarity are the BLAST and BLAST 2.0 algorithms, which are described in Altschul *et al.* (1977) *Nucl. Acids Res.* 25:3389-3402 and Altschul *et al.* (1990) *J. Mol. Biol.* 215:403-410, respectively. BLAST and BLAST 2.0 can be used, for example with the parameters described herein, to determine percent sequence identity for the polynucleotides and polypeptides of the invention. Software for performing BLAST analyses is publicly available through the National Center for Biotechnology Information. In one illustrative example, cumulative scores can be calculated using, for nucleotide sequences, the parameters M (reward score for a pair of matching residues; always >0) and N (penalty score for mismatching residues; always <0). For amino acid sequences, a scoring matrix can be used to calculate the cumulative score. Extension of the word hits in each direction are halted when: the cumulative alignment score falls off by the quantity X from its maximum achieved value; the cumulative score goes to zero or below, due to the accumulation of one or more negative-scoring residue alignments; or the end of either sequence is reached. The BLAST algorithm parameters W, T and X determine the sensitivity and speed of the alignment. The BLASTN program (for nucleotide sequences) uses as defaults a wordlength (W) of 11, and expectation (E) of 10, and the BLOSUM62 scoring matrix (see Henikoff and Henikoff (1989) *Proc. Natl. Acad. Sci. USA* 89:10915) alignments, (B) of 50, expectation (E) of 10, M=5, N=-4 and a comparison of both strands.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (*i.e.*, gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the

total number of positions in the reference sequence (*i.e.*, the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Therefore, the present invention encompasses polynucleotide and polypeptide sequences having substantial identity to the sequences disclosed herein, for example those comprising at least 50% sequence identity, preferably at least 55%, 60%, 65%, 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, or 99% or higher, sequence identity compared to a polynucleotide or polypeptide sequence of this invention using the methods described herein, (*e.g.*, BLAST analysis using standard parameters, as described below). One skilled in this art will recognize that these values can be appropriately adjusted to determine corresponding identity of proteins encoded by two nucleotide sequences by taking into account codon degeneracy, amino acid similarity, reading frame positioning and the like.

In additional embodiments, the present invention provides isolated polynucleotides and polypeptides comprising various lengths of contiguous stretches of sequence identical to or complementary to one or more of the sequences disclosed herein. For example, polynucleotides are provided by this invention that comprise at least about 15, 20, 30, 40, 50, 75, 100, 150, 200, 300, 400, 500 or 1000 or more contiguous nucleotides of one or more of the sequences disclosed herein as well as all intermediate lengths there between. It will be readily understood that "intermediate lengths", in this context, means any length between the quoted values, such as 16, 17, 18, 19, *etc.*; 21, 22, 23, *etc.*; 30, 31, 32, *etc.*; 50, 51, 52, 53, *etc.*; 100, 101, 102, 103, *etc.*; 150, 151, 152, 153, *etc.*; including all integers through 200-500; 500-1,000, and the like.

The polynucleotides of the present invention, or fragments thereof, regardless of the length of the coding sequence itself, may be combined with other DNA sequences, such as promoters, polyadenylation signals, additional restriction enzyme sites, multiple cloning sites, other coding segments, and the like, such that their overall length may vary considerably. It is therefore contemplated that a nucleic acid fragment of almost any length may be employed, with the total length preferably being limited by the ease of preparation and use in the intended recombinant DNA protocol. For example, illustrative DNA segments with total lengths of about 10,000, about 5000,

about 3000, about 2,000, about 1,000, about 500, about 200, about 100, about 50 base pairs in length, and the like, (including all intermediate lengths) are contemplated to be useful in many implementations of this invention.

In other embodiments, the present invention is directed to polynucleotides that are capable of hybridizing under moderately stringent conditions to a polynucleotide sequence provided herein, or a fragment thereof, or a complementary sequence thereof. Hybridization techniques are well known in the art of molecular biology. For purposes of illustration, suitable moderately stringent conditions for testing the hybridization of a polynucleotide of this invention with other polynucleotides include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

Moreover, it will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

PROBES AND PRIMERS

In other embodiments of the present invention, the polynucleotide sequences provided herein can be advantageously used as probes or primers for nucleic acid hybridization. As such, it is contemplated that nucleic acid segments that comprise a sequence region of at least about 15 nucleotide long contiguous sequence that has the

same sequence as, or is complementary to, a 15 nucleotide long contiguous sequence disclosed herein will find particular utility. Longer contiguous identical or complementary sequences, *e.g.*, those of about 20, 30, 40, 50, 100, 200, 500, 1000 (including all intermediate lengths) and even up to full length sequences will also be of use in certain embodiments.

The ability of such nucleic acid probes to specifically hybridize to a sequence of interest will enable them to be of use in detecting the presence of complementary sequences in a given sample. However, other uses are also envisioned, such as the use of the sequence information for the preparation of mutant species primers, or primers for use in preparing other genetic constructions.

Polynucleotide molecules having sequence regions consisting of contiguous nucleotide stretches of 10-14, 15-20, 30, 50, or even of 100-200 nucleotides or so (including intermediate lengths as well), identical or complementary to a polynucleotide sequence disclosed herein, are particularly contemplated as hybridization probes for use in, *e.g.*, Southern and Northern blotting. This would allow a gene product, or fragment thereof, to be analyzed, both in diverse cell types and also in various bacterial cells. The total size of fragment, as well as the size of the complementary stretch(es), will ultimately depend on the intended use or application of the particular nucleic acid segment. Smaller fragments will generally find use in hybridization embodiments, wherein the length of the contiguous complementary region may be varied, such as between about 15 and about 100 nucleotides, but larger contiguous complementarity stretches may be used, according to the length complementary sequences one wishes to detect.

The use of a hybridization probe of about 15-25 nucleotides in length allows the formation of a duplex molecule that is both stable and selective. Molecules having contiguous complementary sequences over stretches greater than 15 bases in length are generally preferred, though, in order to increase stability and selectivity of the hybrid, and thereby improve the quality and degree of specific hybrid molecules obtained. One will generally prefer to design nucleic acid molecules having complementary stretches of 15 to 25 contiguous nucleotides, or even longer where desired.

Hybridization probes may be selected from any portion of any of the sequences disclosed herein. All that is required is to review the sequence set forth in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826, or to any continuous portion of the sequence, from about 15-25 nucleotides in length up to and including the full length sequence, that one wishes to utilize as a probe or primer. The choice of probe and primer sequences may be governed by various factors. For example, one may wish to employ primers from towards the termini of the total sequence.

Small polynucleotide segments or fragments may be readily prepared by, for example, directly synthesizing the fragment by chemical means, as is commonly practiced using an automated oligonucleotide synthesizer. Also, fragments may be obtained by application of nucleic acid reproduction technology, such as the PCRTM technology of U. S. Patent 4,683,202 (incorporated herein by reference), by introducing selected sequences into recombinant vectors for recombinant production, and by other recombinant DNA techniques generally known to those of skill in the art of molecular biology.

The nucleotide sequences of the invention may be used for their ability to selectively form duplex molecules with complementary stretches of the entire gene or gene fragments of interest. Depending on the application envisioned, one will typically desire to employ varying conditions of hybridization to achieve varying degrees of selectivity of probe towards target sequence. For applications requiring high selectivity, one will typically desire to employ relatively stringent conditions to form the hybrids, *e.g.*, one will select relatively low salt and/or high temperature conditions, such as provided by a salt concentration of from about 0.02 M to about 0.15 M salt at temperatures of from about 50°C to about 70°C. Such selective conditions tolerate

little, if any, mismatch between the probe and the template or target strand, and would be particularly suitable for isolating related sequences.

Of course, for some applications, for example, where one desires to prepare mutants employing a mutant primer strand hybridized to an underlying
5 template, less stringent (reduced stringency) hybridization conditions will typically be needed in order to allow formation of the heteroduplex. In these circumstances, one may desire to employ salt conditions such as those of from about 0.15 M to about 0.9 M salt, at temperatures ranging from about 20°C to about 55°C. Cross-hybridizing species can thereby be readily identified as positively hybridizing signals with respect to control
10 hybridizations. In any case, it is generally appreciated that conditions can be rendered more stringent by the addition of increasing amounts of formamide, which serves to destabilize the hybrid duplex in the same manner as increased temperature. Thus, hybridization conditions can be readily manipulated, and thus will generally be a method of choice depending on the desired results.

15 POLYNUCLEOTIDE IDENTIFICATION AND CHARACTERIZATION

Polynucleotides may be identified, prepared and/or manipulated using any of a variety of well established techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least two fold greater in a tumor
20 than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed, for example, using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena *et al.*, *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller *et al.*, *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polynucleotides may be
25 amplified from cDNA prepared from cells expressing the proteins described herein, such as lung tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion of a polynucleotide of the present invention may be
30 used to isolate a full length gene from a suitable library (*e.g.*, a lung tumor cDNA

library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions
5 of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then generally screened by hybridizing filters containing
10 denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR
15 using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences can then assembled into a single contiguous sequence. A full length cDNA
20 molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed
25 using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

30 One such amplification technique is inverse PCR (*see* Triglia *et al.*, *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment

in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom *et al.*, *PCR Methods Applic. 1*:111-19, 1991) and walking PCR (Parker *et al.*, *Nucl. Acids. Res. 19*:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

POLYNUCLEOTIDE EXPRESSION IN HOST CELLS

In other embodiments of the invention, polynucleotide sequences or fragments thereof which encode polypeptides of the invention, or fusion proteins or functional equivalents thereof, may be used in recombinant DNA molecules to direct expression of a polypeptide in appropriate host cells. Due to the inherent degeneracy of the genetic code, other DNA sequences that encode substantially the same or a functionally equivalent amino acid sequence may be produced and these sequences may be used to clone and express a given polypeptide.

As will be understood by those of skill in the art, it may be advantageous in some instances to produce polypeptide-encoding nucleotide sequences possessing non-naturally occurring codons. For example, codons preferred by a particular prokaryotic or eukaryotic host can be selected to increase the rate of protein expression
5 or to produce a recombinant RNA transcript having desirable properties, such as a half-life which is longer than that of a transcript generated from the naturally occurring sequence.

Moreover, the polynucleotide sequences of the present invention can be engineered using methods generally known in the art in order to alter polypeptide
10 encoding sequences for a variety of reasons, including but not limited to, alterations which modify the cloning, processing, and/or expression of the gene product. For example, DNA shuffling by random fragmentation and PCR reassembly of gene fragments and synthetic oligonucleotides may be used to engineer the nucleotide sequences. In addition, site-directed mutagenesis may be used to insert new restriction
15 sites, alter glycosylation patterns, change codon preference, produce splice variants, or introduce mutations, and so forth.

In another embodiment of the invention, natural, modified, or recombinant nucleic acid sequences may be ligated to a heterologous sequence to encode a fusion protein. For example, to screen peptide libraries for inhibitors of
20 polypeptide activity, it may be useful to encode a chimeric protein that can be recognized by a commercially available antibody. A fusion protein may also be engineered to contain a cleavage site located between the polypeptide-encoding sequence and the heterologous protein sequence, so that the polypeptide may be cleaved and purified away from the heterologous moiety.

25 Sequences encoding a desired polypeptide may be synthesized, in whole or in part, using chemical methods well known in the art (see Caruthers, M. H. *et al.* (1980) *Nucl. Acids Res. Symp. Ser.* 215-223, Horn, T. *et al.* (1980) *Nucl. Acids Res. Symp. Ser.* 225-232). Alternatively, the protein itself may be produced using chemical methods to synthesize the amino acid sequence of a polypeptide, or a portion thereof.
30 For example, peptide synthesis can be performed using various solid-phase techniques (Roberge, J. Y. *et al.* (1995) *Science* 269:202-204) and automated synthesis may be

achieved, for example, using the ABI 431A Peptide Synthesizer (Perkin Elmer, Palo Alto, CA).

A newly synthesized peptide may be substantially purified by preparative high performance liquid chromatography (*e.g.*, Creighton, T. (1983) Proteins, Structures and Molecular Principles, WH Freeman and Co., New York, N.Y.) or other comparable techniques available in the art. The composition of the synthetic peptides may be confirmed by amino acid analysis or sequencing (*e.g.*, the Edman degradation procedure). Additionally, the amino acid sequence of a polypeptide, or any part thereof, may be altered during direct synthesis and/or combined using chemical methods with sequences from other proteins, or any part thereof, to produce a variant polypeptide.

In order to express a desired polypeptide, the nucleotide sequences encoding the polypeptide, or functional equivalents, may be inserted into appropriate expression vector, *i.e.*, a vector which contains the necessary elements for the transcription and translation of the inserted coding sequence. Methods which are well known to those skilled in the art may be used to construct expression vectors containing sequences encoding a polypeptide of interest and appropriate transcriptional and translational control elements. These methods include *in vitro* recombinant DNA techniques, synthetic techniques, and *in vivo* genetic recombination. Such techniques are described in Sambrook, J. *et al.* (1989) Molecular Cloning, A Laboratory Manual, Cold Spring Harbor Press, Plainview, N.Y., and Ausubel, F. M. *et al.* (1989) Current Protocols in Molecular Biology, John Wiley & Sons, New York, N.Y.

A variety of expression vector/host systems may be utilized to contain and express polynucleotide sequences. These include, but are not limited to, microorganisms such as bacteria transformed with recombinant bacteriophage, plasmid, or cosmid DNA expression vectors; yeast transformed with yeast expression vectors; insect cell systems infected with virus expression vectors (*e.g.*, baculovirus); plant cell systems transformed with virus expression vectors (*e.g.*, cauliflower mosaic virus, CaMV; tobacco mosaic virus, TMV) or with bacterial expression vectors (*e.g.*, Ti or pBR322 plasmids); or animal cell systems.

The "control elements" or "regulatory sequences" present in an expression vector are those non-translated regions of the vector--enhancers, promoters, 5' and 3' untranslated regions--which interact with host cellular proteins to carry out transcription and translation. Such elements may vary in their strength and specificity.

5 Depending on the vector system and host utilized, any number of suitable transcription and translation elements, including constitutive and inducible promoters, may be used. For example, when cloning in bacterial systems, inducible promoters such as the hybrid lacZ promoter of the PBLUESCRIPT phagemid (Stratagene, La Jolla, Calif.) or PSPORT1 plasmid (Gibco BRL, Gaithersburg, MD) and the like may be used. In

10 mammalian cell systems, promoters from mammalian genes or from mammalian viruses are generally preferred. If it is necessary to generate a cell line that contains multiple copies of the sequence encoding a polypeptide, vectors based on SV40 or EBV may be advantageously used with an appropriate selectable marker.

In bacterial systems, a number of expression vectors may be selected

15 depending upon the use intended for the expressed polypeptide. For example, when large quantities are needed, for example for the induction of antibodies, vectors which direct high level expression of fusion proteins that are readily purified may be used. Such vectors include, but are not limited to, the multifunctional *E. coli* cloning and expression vectors such as BLUESCRIPT (Stratagene), in which the sequence encoding

20 the polypeptide of interest may be ligated into the vector in frame with sequences for the amino-terminal Met and the subsequent 7 residues of .beta.-galactosidase so that a hybrid protein is produced; pIN vectors (Van Heeke, G. and S. M. Schuster (1989) *J. Biol. Chem.* 264:5503-5509); and the like. pGEX Vectors (Promega, Madison, Wis.) may also be used to express foreign polypeptides as fusion proteins with glutathione S-

25 transferase (GST). In general, such fusion proteins are soluble and can easily be purified from lysed cells by adsorption to glutathione-agarose beads followed by elution in the presence of free glutathione. Proteins made in such systems may be designed to include heparin, thrombin, or factor XA protease cleavage sites so that the cloned polypeptide of interest can be released from the GST moiety at will.

30 In the yeast, *Saccharomyces cerevisiae*, a number of vectors containing constitutive or inducible promoters such as alpha factor, alcohol oxidase, and PGH may

be used. For reviews, see Ausubel *et al.* (supra) and Grant *et al.* (1987) *Methods Enzymol.* 153:516-544.

In cases where plant expression vectors are used, the expression of sequences encoding polypeptides may be driven by any of a number of promoters. For example, viral promoters such as the 35S and 19S promoters of CaMV may be used
5 alone or in combination with the omega leader sequence from TMV (Takamatsu, N. (1987) *EMBO J.* 6:307-311. Alternatively, plant promoters such as the small subunit of RUBISCO or heat shock promoters may be used (Coruzzi, G. *et al.* (1984) *EMBO J.* 3:1671-1680; Broglie, R. *et al.* (1984) *Science* 224:838-843; and Winter, J. *et al.* (1991)
10 *Results Probl. Cell Differ.* 17:85-105). These constructs can be introduced into plant cells by direct DNA transformation or pathogen-mediated transfection. Such techniques are described in a number of generally available reviews (see, for example, Hobbs, S. or Murry, L. E. in McGraw Hill Yearbook of Science and Technology (1992) McGraw Hill, New York, N.Y.; pp. 191-196).

15 An insect system may also be used to express a polypeptide of interest. For example, in one such system, Autographa californica nuclear polyhedrosis virus (AcNPV) is used as a vector to express foreign genes in *Spodoptera frugiperda* cells or in *Trichoplusia* larvae. The sequences encoding the polypeptide may be cloned into a non-essential region of the virus, such as the polyhedrin gene, and placed under control
20 of the polyhedrin promoter. Successful insertion of the polypeptide-encoding sequence will render the polyhedrin gene inactive and produce recombinant virus lacking coat protein. The recombinant viruses may then be used to infect, for example, *S. frugiperda* cells or *Trichoplusia* larvae in which the polypeptide of interest may be expressed (Engelhard, E. K. *et al.* (1994) *Proc. Natl. Acad. Sci.* 91 :3224-3227).

25 In mammalian host cells, a number of viral-based expression systems are generally available. For example, in cases where an adenovirus is used as an expression vector, sequences encoding a polypeptide of interest may be ligated into an adenovirus transcription/translation complex consisting of the late promoter and tripartite leader sequence. Insertion in a non-essential E1 or E3 region of the viral genome may be used
30 to obtain a viable virus which is capable of expressing the polypeptide in infected host cells (Logan, J. and Shenk, T. (1984) *Proc. Natl. Acad. Sci.* 81:3655-3659). In addition,

transcription enhancers, such as the Rous sarcoma virus (RSV) enhancer, may be used to increase expression in mammalian host cells.

Specific initiation signals may also be used to achieve more efficient translation of sequences encoding a polypeptide of interest. Such signals include the
5 ATG initiation codon and adjacent sequences. In cases where sequences encoding the polypeptide, its initiation codon, and upstream sequences are inserted into the appropriate expression vector, no additional transcriptional or translational control signals may be needed. However, in cases where only coding sequence, or a portion thereof, is inserted, exogenous translational control signals including the ATG initiation
10 codon should be provided. Furthermore, the initiation codon should be in the correct reading frame to ensure translation of the entire insert. Exogenous translational elements and initiation codons may be of various origins, both natural and synthetic. The efficiency of expression may be enhanced by the inclusion of enhancers which are appropriate for the particular cell system which is used, such as those described in the
15 literature (Scharf, D. *et al.* (1994) *Results Probl. Cell Differ.* 20:125-162).

In addition, a host cell strain may be chosen for its ability to modulate the expression of the inserted sequences or to process the expressed protein in the desired fashion. Such modifications of the polypeptide include, but are not limited to, acetylation, carboxylation, glycosylation, phosphorylation, lipidation, and acylation.
20 Post-translational processing which cleaves a "prepro" form of the protein may also be used to facilitate correct insertion, folding and/or function. Different host cells such as CHO, HeLa, MDCK, HEK293, and WI38, which have specific cellular machinery and characteristic mechanisms for such post-translational activities, may be chosen to ensure the correct modification and processing of the foreign protein.

25 For long-term, high-yield production of recombinant proteins, stable expression is generally preferred. For example, cell lines which stably express a polynucleotide of interest may be transformed using expression vectors which may contain viral origins of replication and/or endogenous expression elements and a selectable marker gene on the same or on a separate vector. Following the introduction
30 of the vector, cells may be allowed to grow for 1-2 days in an enriched media before they are switched to selective media. The purpose of the selectable marker is to confer

resistance to selection, and its presence allows growth and recovery of cells which successfully express the introduced sequences. Resistant clones of stably transformed cells may be proliferated using tissue culture techniques appropriate to the cell type.

Any number of selection systems may be used to recover transformed
5 cell lines. These include, but are not limited to, the herpes simplex virus thymidine kinase (Wigler, M. *et al.* (1977) *Cell* 11:223-32) and adenine phosphoribosyltransferase (Lowy, I. *et al.* (1990) *Cell* 22:817-23) genes which can be employed in tk.sup.- or
aprt.sup.- cells, respectively. Also, antimetabolite, antibiotic or herbicide resistance can be used as the basis for selection; for example, dhfr which confers resistance to
10 methotrexate (Wigler, M. *et al.* (1980) *Proc. Natl. Acad. Sci.* 77:3567-70); npt, which confers resistance to the aminoglycosides, neomycin and G-418 (Colbere-Garapin, F. *et al.* (1981) *J. Mol. Biol.* 150:1-14); and als or pat, which confer resistance to
chlorsulfuron and phosphinotricin acetyltransferase, respectively (Murry, *supra*). Additional selectable genes have been described, for example, trpB, which allows cells
15 to utilize indole in place of tryptophan, or hisD, which allows cells to utilize histinol in place of histidine (Hartman, S. C. and R. C. Mulligan (1988) *Proc. Natl. Acad. Sci.* 85:8047-51). Recently, the use of visible markers has gained popularity with such
markers as anthocyanins, beta-glucuronidase and its substrate GUS, and luciferase and its substrate luciferin, being widely used not only to identify transformants, but also to
20 quantify the amount of transient or stable protein expression attributable to a specific vector system (Rhodes, C. A. *et al.* (1995) *Methods Mol. Biol.* 55:121-131).

Although the presence/absence of marker gene expression suggests that the gene of interest is also present, its presence and expression may need to be confirmed. For example, if the sequence encoding a polypeptide is inserted within a
25 marker gene sequence, recombinant cells containing sequences can be identified by the absence of marker gene function. Alternatively, a marker gene can be placed in tandem with a polypeptide-encoding sequence under the control of a single promoter. Expression of the marker gene in response to induction or selection usually indicates expression of the tandem gene as well.

30 Alternatively, host cells which contain and express a desired polynucleotide sequence may be identified by a variety of procedures known to those of

skill in the art. These procedures include, but are not limited to, DNA-DNA or DNA-RNA hybridizations and protein bioassay or immunoassay techniques which include membrane, solution, or chip based technologies for the detection and/or quantification of nucleic acid or protein.

5 A variety of protocols for detecting and measuring the expression of polynucleotide-encoded products, using either polyclonal or monoclonal antibodies specific for the product are known in the art. Examples include enzyme-linked immunosorbent assay (ELISA), radioimmunoassay (RIA), and fluorescence activated cell sorting (FACS). A two-site, monoclonal-based immunoassay utilizing monoclonal
10 antibodies reactive to two non-interfering epitopes on a given polypeptide may be preferred for some applications, but a competitive binding assay may also be employed. These and other assays are described, among other places, in Hampton, R. *et al.* (1990; Serological Methods, a Laboratory Manual, APS Press, St Paul, Minn.) and Maddox, D. E. *et al.* (1983; *J. Exp. Med.* 158:1211-1216).

15 A wide variety of labels and conjugation techniques are known by those skilled in the art and may be used in various nucleic acid and amino acid assays. Means for producing labeled hybridization or PCR probes for detecting sequences related to polynucleotides include oligolabeling, nick translation, end-labeling or PCR amplification using a labeled nucleotide. Alternatively, the sequences, or any portions
20 thereof may be cloned into a vector for the production of an mRNA probe. Such vectors are known in the art, are commercially available, and may be used to synthesize RNA probes in vitro by addition of an appropriate RNA polymerase such as T7, T3, or SP6 and labeled nucleotides. These procedures may be conducted using a variety of commercially available kits. Suitable reporter molecules or labels, which may be used
25 include radionuclides, enzymes, fluorescent, chemiluminescent, or chromogenic agents as well as substrates, cofactors, inhibitors, magnetic particles, and the like.

 Host cells transformed with a polynucleotide sequence of interest may be cultured under conditions suitable for the expression and recovery of the protein from cell culture. The protein produced by a recombinant cell may be secreted or contained
30 intracellularly depending on the sequence and/or the vector used. As will be understood by those of skill in the art, expression vectors containing polynucleotides of the

invention may be designed to contain signal sequences which direct secretion of the encoded polypeptide through a prokaryotic or eukaryotic cell membrane. Other recombinant constructions may be used to join sequences encoding a polypeptide of interest to nucleotide sequence encoding a polypeptide domain which will facilitate purification of soluble proteins. Such purification facilitating domains include, but are not limited to, metal chelating peptides such as histidine-tryptophan modules that allow purification on immobilized metals, protein A domains that allow purification on immobilized immunoglobulin, and the domain utilized in the FLAGS extension/affinity purification system (Immunex Corp., Seattle, Wash.). The inclusion of cleavable linker sequences such as those specific for Factor XA or enterokinase (Invitrogen, San Diego, Calif.) between the purification domain and the encoded polypeptide may be used to facilitate purification. One such expression vector provides for expression of a fusion protein containing a polypeptide of interest and a nucleic acid encoding 6 histidine residues preceding a thioredoxin or an enterokinase cleavage site. The histidine residues facilitate purification on IMIAC (immobilized metal ion affinity chromatography) as described in Porath, J. *et al.* (1992, *Prot. Exp. Purif.* 3:263-281) while the enterokinase cleavage site provides a means for purifying the desired polypeptide from the fusion protein. A discussion of vectors which contain fusion proteins is provided in Kroll, D. J. *et al.* (1993; *DNA Cell Biol.* 12:441-453).

In addition to recombinant production methods, polypeptides of the invention, and fragments thereof, may be produced by direct peptide synthesis using solid-phase techniques (Merrifield J. (1963) *J. Am. Chem. Soc.* 85:2149-2154). Protein synthesis may be performed using manual techniques or by automation. Automated synthesis may be achieved, for example, using Applied Biosystems 431A Peptide Synthesizer (Perkin Elmer). Alternatively, various fragments may be chemically synthesized separately and combined using chemical methods to produce the full length molecule.

SITE-SPECIFIC MUTAGENESIS

Site-specific mutagenesis is a technique useful in the preparation of individual peptides, or biologically functional equivalent polypeptides, through specific

mutagenesis of the underlying polynucleotides that encode them. The technique, well-known to those of skill in the art, further provides a ready ability to prepare and test sequence variants, for example, incorporating one or more of the foregoing considerations, by introducing one or more nucleotide sequence changes into the DNA.

5 Site-specific mutagenesis allows the production of mutants through the use of specific oligonucleotide sequences which encode the DNA sequence of the desired mutation, as well as a sufficient number of adjacent nucleotides, to provide a primer sequence of sufficient size and sequence complexity to form a stable duplex on both sides of the deletion junction being traversed. Mutations may be employed in a selected
10 polynucleotide sequence to improve, alter, decrease, modify, or otherwise change the properties of the polynucleotide itself, and/or alter the properties, activity, composition, stability, or primary sequence of the encoded polypeptide.

In certain embodiments of the present invention, the inventors contemplate the mutagenesis of the disclosed polynucleotide sequences to alter one or
15 more properties of the encoded polypeptide, such as the antigenicity of a polypeptide vaccine. The techniques of site-specific mutagenesis are well-known in the art, and are widely used to create variants of both polypeptides and polynucleotides. For example, site-specific mutagenesis is often used to alter a specific portion of a DNA molecule. In such embodiments, a primer comprising typically about 14 to about 25 nucleotides or so
20 in length is employed, with about 5 to about 10 residues on both sides of the junction of the sequence being altered.

As will be appreciated by those of skill in the art, site-specific mutagenesis techniques have often employed a phage vector that exists in both a single stranded and double stranded form. Typical vectors useful in site-directed mutagenesis
25 include vectors such as the M13 phage. These phage are readily commercially-available and their use is generally well-known to those skilled in the art. Double-stranded plasmids are also routinely employed in site directed mutagenesis that eliminates the step of transferring the gene of interest from a plasmid to a phage.

In general, site-directed mutagenesis in accordance herewith is
30 performed by first obtaining a single-stranded vector or melting apart of two strands of a double-stranded vector that includes within its sequence a DNA sequence that

encodes the desired peptide. An oligonucleotide primer bearing the desired mutated sequence is prepared, generally synthetically. This primer is then annealed with the single-stranded vector, and subjected to DNA polymerizing enzymes such as *E. coli* polymerase I Klenow fragment, in order to complete the synthesis of the mutation-bearing strand. Thus, a heteroduplex is formed wherein one strand encodes the original non-mutated sequence and the second strand bears the desired mutation. This heteroduplex vector is then used to transform appropriate cells, such as *E. coli* cells, and clones are selected which include recombinant vectors bearing the mutated sequence arrangement.

The preparation of sequence variants of the selected peptide-encoding DNA segments using site-directed mutagenesis provides a means of producing potentially useful species and is not meant to be limiting as there are other ways in which sequence variants of peptides and the DNA sequences encoding them may be obtained. For example, recombinant vectors encoding the desired peptide sequence may be treated with mutagenic agents, such as hydroxylamine, to obtain sequence variants. Specific details regarding these methods and protocols are found in the teachings of Maloy *et al.*, 1994; Segal, 1976; Prokop and Bajpai, 1991; Kuby, 1994; and Maniatis *et al.*, 1982, each incorporated herein by reference, for that purpose.

As used herein, the term "oligonucleotide directed mutagenesis procedure" refers to template-dependent processes and vector-mediated propagation which result in an increase in the concentration of a specific nucleic acid molecule relative to its initial concentration, or in an increase in the concentration of a detectable signal, such as amplification. As used herein, the term "oligonucleotide directed mutagenesis procedure" is intended to refer to a process that involves the template-dependent extension of a primer molecule. The term template dependent process refers to nucleic acid synthesis of an RNA or a DNA molecule wherein the sequence of the newly synthesized strand of nucleic acid is dictated by the well-known rules of complementary base pairing (see, for example, Watson, 1987). Typically, vector mediated methodologies involve the introduction of the nucleic acid fragment into a DNA or RNA vector, the clonal amplification of the vector, and the recovery of

the amplified nucleic acid fragment. Examples of such methodologies are provided by U. S. Patent No. 4,237,224, specifically incorporated herein by reference in its entirety.

POLYNUCLEOTIDE AMPLIFICATION TECHNIQUES

A number of template dependent processes are available to amplify the target sequences of interest present in a sample. One of the best known amplification methods is the polymerase chain reaction (PCRTM) which is described in detail in U.S. Patent Nos. 4,683,195, 4,683,202 and 4,800,159, each of which is incorporated herein by reference in its entirety. Briefly, in PCRTM, two primer sequences are prepared which are complementary to regions on opposite complementary strands of the target sequence. An excess of deoxynucleoside triphosphates is added to a reaction mixture along with a DNA polymerase (*e.g.*, *Taq* polymerase). If the target sequence is present in a sample, the primers will bind to the target and the polymerase will cause the primers to be extended along the target sequence by adding on nucleotides. By raising and lowering the temperature of the reaction mixture, the extended primers will dissociate from the target to form reaction products, excess primers will bind to the target and to the reaction product and the process is repeated. Preferably reverse transcription and PCRTM amplification procedure may be performed in order to quantify the amount of mRNA amplified. Polymerase chain reaction methodologies are well known in the art.

Another method for amplification is the ligase chain reaction (referred to as LCR), disclosed in Eur. Pat. Appl. Publ. No. 320,308 (specifically incorporated herein by reference in its entirety). In LCR, two complementary probe pairs are prepared, and in the presence of the target sequence, each pair will bind to opposite complementary strands of the target such that they abut. In the presence of a ligase, the two probe pairs will link to form a single unit. By temperature cycling, as in PCRTM, bound ligated units dissociate from the target and then serve as "target sequences" for ligation of excess probe pairs. U.S. Patent No. 4,883,750, incorporated herein by reference in its entirety, describes an alternative method of amplification similar to LCR for binding probe pairs to a target sequence.

Qbeta Replicase, described in PCT Intl. Pat. Appl. Publ. No. PCT/US87/00880, incorporated herein by reference in its entirety, may also be used as still another amplification method in the present invention. In this method, a replicative sequence of RNA that has a region complementary to that of a target is added to a
5 sample in the presence of an RNA polymerase. The polymerase will copy the replicative sequence that can then be detected.

An isothermal amplification method, in which restriction endonucleases and ligases are used to achieve the amplification of target molecules that contain nucleotide 5'-[α -thio]triphosphates in one strand of a restriction site (Walker *et al.*,
10 1992, incorporated herein by reference in its entirety), may also be useful in the amplification of nucleic acids in the present invention.

Strand Displacement Amplification (SDA) is another method of carrying out isothermal amplification of nucleic acids which involves multiple rounds of strand displacement and synthesis, *i.e.* nick translation. A similar method, called Repair Chain
15 Reaction (RCR) is another method of amplification which may be useful in the present invention and is involves annealing several probes throughout a region targeted for amplification, followed by a repair reaction in which only two of the four bases are present. The other two bases can be added as biotinylated derivatives for easy detection. A similar approach is used in SDA.

20 Sequences can also be detected using a cyclic probe reaction (CPR). In CPR, a probe having a 3' and 5' sequences of non-target DNA and an internal or "middle" sequence of the target protein specific RNA is hybridized to DNA which is present in a sample. Upon hybridization, the reaction is treated with RNaseH, and the products of the probe are identified as distinctive products by generating a signal that is
25 released after digestion. The original template is annealed to another cycling probe and the reaction is repeated. Thus, CPR involves amplifying a signal generated by hybridization of a probe to a target gene specific expressed nucleic acid.

Still other amplification methods described in Great Britain Pat. Appl. No. 2 202 328, and in PCT Intl. Pat. Appl. Publ. No. PCT/US89/01025, each of which
30 is incorporated herein by reference in its entirety, may be used in accordance with the present invention. In the former application, "modified" primers are used in a PCR-

like, template and enzyme dependent synthesis. The primers may be modified by labeling with a capture moiety (*e.g.*, biotin) and/or a detector moiety (*e.g.*, enzyme). In the latter application, an excess of labeled probes is added to a sample. In the presence of the target sequence, the probe binds and is cleaved catalytically. After cleavage, the target sequence is released intact to be bound by excess probe. Cleavage of the labeled probe signals the presence of the target sequence.

Other nucleic acid amplification procedures include transcription-based amplification systems (TAS) (Kwoh *et al.*, 1989; PCT Intl. Pat. Appl. Publ. No. WO 88/10315, incorporated herein by reference in its entirety), including nucleic acid sequence based amplification (NASBA) and 3SR. In NASBA, the nucleic acids can be prepared for amplification by standard phenol/chloroform extraction, heat denaturation of a sample, treatment with lysis buffer and minispin columns for isolation of DNA and RNA or guanidinium chloride extraction of RNA. These amplification techniques involve annealing a primer that has sequences specific to the target sequence. Following polymerization, DNA/RNA hybrids are digested with RNase H while double stranded DNA molecules are heat-denatured again. In either case the single stranded DNA is made fully double stranded by addition of second target-specific primer, followed by polymerization. The double stranded DNA molecules are then multiply transcribed by a polymerase such as T7 or SP6. In an isothermal cyclic reaction, the RNAs are reverse transcribed into DNA, and transcribed once again with a polymerase such as T7 or SP6. The resulting products, whether truncated or complete, indicate target-specific sequences.

Eur. Pat. Appl. Publ. No. 329,822, incorporated herein by reference in its entirety, disclose a nucleic acid amplification process involving cyclically synthesizing single-stranded RNA ("ssRNA"), ssDNA, and double-stranded DNA (dsDNA), which may be used in accordance with the present invention. The ssRNA is a first template for a first primer oligonucleotide, which is elongated by reverse transcriptase (RNA-dependent DNA polymerase). The RNA is then removed from resulting DNA:RNA duplex by the action of ribonuclease H (RNase H, an RNase specific for RNA in a duplex with either DNA or RNA). The resultant ssDNA is a second template for a second primer, which also includes the sequences of an RNA polymerase

promoter (exemplified by T7 RNA polymerase) 5' to its homology to its template. This primer is then extended by DNA polymerase (exemplified by the large "Klenow" fragment of *E. coli* DNA polymerase I), resulting as a double-stranded DNA ("dsDNA") molecule, having a sequence identical to that of the original RNA between
5 the primers and having additionally, at one end, a promoter sequence. This promoter sequence can be used by the appropriate RNA polymerase to make many RNA copies of the DNA. These copies can then re-enter the cycle leading to very swift amplification. With proper choice of enzymes, this amplification can be done isothermally without addition of enzymes at each cycle. Because of the cyclical nature
10 of this process, the starting sequence can be chosen to be in the form of either DNA or RNA.

PCT Intl. Pat. Appl. Publ. No. WO 89/06700, incorporated herein by reference in its entirety, disclose a nucleic acid sequence amplification scheme based on the hybridization of a promoter/primer sequence to a target single-stranded DNA
15 ("ssDNA") followed by transcription of many RNA copies of the sequence. This scheme is not cyclic; *i.e.* new templates are not produced from the resultant RNA transcripts. Other amplification methods include "RACE" (Frohman, 1990), and "one-sided PCR" (Ohara, 1989) which are well-known to those of skill in the art.

Methods based on ligation of two (or more) oligonucleotides in the
20 presence of nucleic acid having the sequence of the resulting "di-oligonucleotide", thereby amplifying the di-oligonucleotide (Wu and Dean, 1996, incorporated herein by reference in its entirety), may also be used in the amplification of DNA sequences of the present invention.

BIOLOGICAL FUNCTIONAL EQUIVALENTS

25 Modification and changes may be made in the structure of the polynucleotides and polypeptides of the present invention and still obtain a functional molecule that encodes a polypeptide with desirable characteristics. As mentioned above, it is often desirable to introduce one or more mutations into a specific polynucleotide sequence. In certain circumstances, the resulting encoded polypeptide

sequence is altered by this mutation, or in other cases, the sequence of the polypeptide is unchanged by one or more mutations in the encoding polynucleotide.

When it is desirable to alter the amino acid sequence of a polypeptide to create an equivalent, or even an improved, second-generation molecule, the amino acid
5 changes may be achieved by changing one or more of the codons of the encoding DNA sequence, according to Table 1.

For example, certain amino acids may be substituted for other amino acids in a protein structure without appreciable loss of interactive binding capacity with structures such as, for example, antigen-binding regions of antibodies or binding sites
10 on substrate molecules. Since it is the interactive capacity and nature of a protein that defines that protein's biological functional activity, certain amino acid sequence substitutions can be made in a protein sequence, and, of course, its underlying DNA coding sequence, and nevertheless obtain a protein with like properties. It is thus contemplated by the inventors that various changes may be made in the peptide
15 sequences of the disclosed compositions, or corresponding DNA sequences which encode said peptides without appreciable loss of their biological utility or activity.

TABLE 1

Amino Acids			Codons					
Alanine	Ala	A	GCA	GCC	GCG	GCU		
Cysteine	Cys	C	UGC	UGU				
Aspartic acid	Asp	D	GAC	GAU				
Glutamic acid	Glu	E	GAA	GAG				
Phenylalanine	Phe	F	UUC	UUU				
Glycine	Gly	G	GGA	GGC	GGG	GGU		
Histidine	His	H	CAC	CAU				
Isoleucine	Ile	I	AUA	AUC	AUU			
Lysine	Lys	K	AAA	AAG				
Leucine	Leu	L	UUA	UUG	CUA	CUC	CUG	CUU
Methionine	Met	M	AUG					
Asparagine	Asn	N	AAC	AAU				
Proline	Pro	P	CCA	CCC	CCG	CCU		
Glutamine	Gln	Q	CAA	CAG				
Arginine	Arg	R	AGA	AGG	CGA	CGC	CGG	CGU
Serine	Ser	S	AGC	AGU	UCA	UCC	UCG	UCU
Threonine	Thr	T	ACA	ACC	ACG	ACU		
Valine	Val	V	GUA	GUC	GUG	GUU		
Tryptophan	Trp	W	UGG					
Tyrosine	Tyr	Y	UAC	UAU				

In making such changes, the hydropathic index of amino acids may be considered. The importance of the hydropathic amino acid index in conferring interactive biologic function on a protein is generally understood in the art (Kyte and Doolittle, 1982, incorporated herein by reference). It is accepted that the relative hydropathic character of the amino acid contributes to the secondary structure of the resultant protein, which in turn defines the interaction of the protein with other molecules, for example, enzymes, substrates, receptors, DNA, antibodies, antigens, and the like. Each amino acid has been assigned a hydropathic index on the basis of its hydrophobicity and charge characteristics (Kyte and Doolittle, 1982). These values are:

isoleucine (+4.5); valine (+4.2); leucine (+3.8); phenylalanine (+2.8); cysteine/cystine (+2.5); methionine (+1.9); alanine (+1.8); glycine (−0.4); threonine (−0.7); serine (−0.8); tryptophan (−0.9); tyrosine (−1.3); proline (−1.6); histidine (−3.2); glutamate (−3.5); glutamine (−3.5); aspartate (−3.5); asparagine (−3.5); lysine (−3.9); and arginine (−4.5).

It is known in the art that certain amino acids may be substituted by other amino acids having a similar hydropathic index or score and still result in a protein with similar biological activity, *i.e.* still obtain a biological functionally equivalent protein. In making such changes, the substitution of amino acids whose hydropathic indices are within ± 2 is preferred, those within ± 1 are particularly preferred, and those within ± 0.5 are even more particularly preferred. It is also understood in the art that the substitution of like amino acids can be made effectively on the basis of hydrophilicity. U. S. Patent 4,554,101 (specifically incorporated herein by reference in its entirety), states that the greatest local average hydrophilicity of a protein, as governed by the hydrophilicity of its adjacent amino acids, correlates with a biological property of the protein.

As detailed in U. S. Patent 4,554,101, the following hydrophilicity values have been assigned to amino acid residues: arginine (+3.0); lysine (+3.0); aspartate (+3.0 \pm 1); glutamate (+3.0 \pm 1); serine (+0.3); asparagine (+0.2); glutamine (+0.2); glycine (0); threonine (−0.4); proline (−0.5 \pm 1); alanine (−0.5); histidine (−0.5); cysteine (−1.0); methionine (−1.3); valine (−1.5); leucine (−1.8); isoleucine (−1.8); tyrosine (−2.3); phenylalanine (−2.5); tryptophan (−3.4). It is understood that an amino acid can be substituted for another having a similar hydrophilicity value and still obtain a biologically equivalent, and in particular, an immunologically equivalent protein. In such changes, the substitution of amino acids whose hydrophilicity values are within ± 2 is preferred, those within ± 1 are particularly preferred, and those within ± 0.5 are even more particularly preferred.

As outlined above, amino acid substitutions are generally therefore based on the relative similarity of the amino acid side-chain substituents, for example, their hydrophobicity, hydrophilicity, charge, size, and the like. Exemplary substitutions that take various of the foregoing characteristics into consideration are well known to those

of skill in the art and include: arginine and lysine; glutamate and aspartate; serine and threonine; glutamine and asparagine; and valine, leucine and isoleucine.

In addition, any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of
5 flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

10 IN VIVO POLYNUCLEOTIDE DELIVERY TECHNIQUES

In additional embodiments, genetic constructs comprising one or more of the polynucleotides of the invention are introduced into cells *in vivo*. This may be achieved using any of a variety of well known approaches, several of which are outlined below for the purpose of illustration.

15 1. ADENOVIRUS

One of the preferred methods for *in vivo* delivery of one or more nucleic acid sequences involves the use of an adenovirus expression vector. "Adenovirus expression vector" is meant to include those constructs containing adenovirus sequences sufficient to (a) support packaging of the construct and (b) to express a
20 polynucleotide that has been cloned therein in a sense or antisense orientation. Of course, in the context of an antisense construct, expression does not require that the gene product be synthesized.

The expression vector comprises a genetically engineered form of an adenovirus. Knowledge of the genetic organization of adenovirus, a 36 kb, linear,
25 double-stranded DNA virus, allows substitution of large pieces of adenoviral DNA with foreign sequences up to 7 kb (Grunhaus and Horwitz, 1992). In contrast to retrovirus, the adenoviral infection of host cells does not result in chromosomal integration because adenoviral DNA can replicate in an episomal manner without potential genotoxicity. Also, adenoviruses are structurally stable, and no genome rearrangement

has been detected after extensive amplification. Adenovirus can infect virtually all epithelial cells regardless of their cell cycle stage. So far, adenoviral infection appears to be linked only to mild disease such as acute respiratory disease in humans.

Adenovirus is particularly suitable for use as a gene transfer vector because of its mid-sized genome, ease of manipulation, high titer, wide target-cell range and high infectivity. Both ends of the viral genome contain 100-200 base pair inverted repeats (ITRs), which are *cis* elements necessary for viral DNA replication and packaging. The early (E) and late (L) regions of the genome contain different transcription units that are divided by the onset of viral DNA replication. The E1 region (E1A and E1B) encodes proteins responsible for the regulation of transcription of the viral genome and a few cellular genes. The expression of the E2 region (E2A and E2B) results in the synthesis of the proteins for viral DNA replication. These proteins are involved in DNA replication, late gene expression and host cell shut-off (Renan, 1990). The products of the late genes, including the majority of the viral capsid proteins, are expressed only after significant processing of a single primary transcript issued by the major late promoter (MLP). The MLP, (located at 16.8 m.u.) is particularly efficient during the late phase of infection, and all the mRNA's issued from this promoter possess a 5'-tripartite leader (TPL) sequence which makes them preferred mRNA's for translation.

In a current system, recombinant adenovirus is generated from homologous recombination between shuttle vector and provirus vector. Due to the possible recombination between two proviral vectors, wild-type adenovirus may be generated from this process. Therefore, it is critical to isolate a single clone of virus from an individual plaque and examine its genomic structure.

Generation and propagation of the current adenovirus vectors, which are replication deficient, depend on a unique helper cell line, designated 293, which was transformed from human embryonic kidney cells by Ad5 DNA fragments and constitutively expresses E1 proteins (Graham *et al.*, 1977). Since the E3 region is dispensable from the adenovirus genome (Jones and Shenk, 1978), the current adenovirus vectors, with the help of 293 cells, carry foreign DNA in either the E1, the D3 or both regions (Graham and Prevec, 1991). In nature, adenovirus can package

approximately 105% of the wild-type genome (Ghosh-Choudhury *et al.*, 1987), providing capacity for about 2 extra kB of DNA. Combined with the approximately 5.5 kB of DNA that is replaceable in the E1 and E3 regions, the maximum capacity of the current adenovirus vector is under 7.5 kB, or about 15% of the total length of the vector. More than 80% of the adenovirus viral genome remains in the vector backbone and is the source of vector-borne cytotoxicity. Also, the replication deficiency of the E1-deleted virus is incomplete. For example, leakage of viral gene expression has been observed with the currently available vectors at high multiplicities of infection (MOI) (Mulligan, 1993).

- 10 Helper cell lines may be derived from human cells such as human embryonic kidney cells, muscle cells, hematopoietic cells or other human embryonic mesenchymal or epithelial cells. Alternatively, the helper cells may be derived from the cells of other mammalian species that are permissive for human adenovirus. Such cells include, *e.g.*, Vero cells or other monkey embryonic mesenchymal or epithelial cells.
- 15 As stated above, the currently preferred helper cell line is 293.

- Recently, Racher *et al.* (1995) disclosed improved methods for culturing 293 cells and propagating adenovirus. In one format, natural cell aggregates are grown by inoculating individual cells into 1 liter siliconized spinner flasks (Techne, Cambridge, UK) containing 100-200 ml of medium. Following stirring at 40 rpm, the cell viability is estimated with trypan blue. In another format, Fibra-Cel microcarriers (Bibby Sterlin, Stone, UK) (5 g/l) is employed as follows. A cell inoculum, resuspended in 5 ml of medium, is added to the carrier (50 ml) in a 250 ml Erlenmeyer flask and left stationary, with occasional agitation, for 1 to 4 h. The medium is then replaced with 50 ml of fresh medium and shaking initiated. For virus production, cells are allowed to grow to about 80% confluence, after which time the medium is replaced (to 25% of the final volume) and adenovirus added at an MOI of 0.05. Cultures are left stationary overnight, following which the volume is increased to 100% and shaking commenced for another 72 h.
- 20 cell viability is estimated with trypan blue. In another format, Fibra-Cel microcarriers (Bibby Sterlin, Stone, UK) (5 g/l) is employed as follows. A cell inoculum, resuspended in 5 ml of medium, is added to the carrier (50 ml) in a 250 ml Erlenmeyer flask and left stationary, with occasional agitation, for 1 to 4 h. The medium is then replaced with 50 ml of fresh medium and shaking initiated. For virus production, cells are allowed to grow to about 80% confluence, after which time the medium is replaced (to 25% of the final volume) and adenovirus added at an MOI of 0.05. Cultures are left stationary overnight, following which the volume is increased to 100% and shaking commenced for another 72 h.
- 25 are allowed to grow to about 80% confluence, after which time the medium is replaced (to 25% of the final volume) and adenovirus added at an MOI of 0.05. Cultures are left stationary overnight, following which the volume is increased to 100% and shaking commenced for another 72 h.

- Other than the requirement that the adenovirus vector be replication defective, or at least conditionally defective, the nature of the adenovirus vector is not believed to be crucial to the successful practice of the invention. The adenovirus may
- 30 defective, or at least conditionally defective, the nature of the adenovirus vector is not believed to be crucial to the successful practice of the invention. The adenovirus may

be of any of the 42 different known serotypes or subgroups A-F. Adenovirus type 5 of subgroup C is the preferred starting material in order to obtain a conditional replication-defective adenovirus vector for use in the present invention, since Adenovirus type 5 is a human adenovirus about which a great deal of biochemical and genetic information is known, and it has historically been used for most constructions employing adenovirus as a vector.

As stated above, the typical vector according to the present invention is replication defective and will not have an adenovirus E1 region. Thus, it will be most convenient to introduce the polynucleotide encoding the gene of interest at the position from which the E1-coding sequences have been removed. However, the position of insertion of the construct within the adenovirus sequences is not critical to the invention. The polynucleotide encoding the gene of interest may also be inserted in lieu of the deleted E3 region in E3 replacement vectors as described by Karlsson *et al.* (1986) or in the E4 region where a helper cell line or helper virus complements the E4 defect.

Adenovirus is easy to grow and manipulate and exhibits broad host range *in vitro* and *in vivo*. This group of viruses can be obtained in high titers, *e.g.*, 10^9 - 10^{11} plaque-forming units per ml, and they are highly infective. The life cycle of adenovirus does not require integration into the host cell genome. The foreign genes delivered by adenovirus vectors are episomal and, therefore, have low genotoxicity to host cells. No side effects have been reported in studies of vaccination with wild-type adenovirus (Couch *et al.*, 1963; Top *et al.*, 1971), demonstrating their safety and therapeutic potential as *in vivo* gene transfer vectors.

Adenovirus vectors have been used in eukaryotic gene expression (Levrero *et al.*, 1991; Gomez-Foix *et al.*, 1992) and vaccine development (Grunhaus and Horwitz, 1992; Graham and Prevec, 1992). Recently, animal studies suggested that recombinant adenovirus could be used for gene therapy (Stratford-Perricaudet and Perricaudet, 1991; Stratford-Perricaudet *et al.*, 1990; Rich *et al.*, 1993). Studies in administering recombinant adenovirus to different tissues include trachea instillation (Rosenfeld *et al.*, 1991; Rosenfeld *et al.*, 1992), muscle injection (Ragot *et al.*, 1993),

peripheral intravenous injections (Herz and Gerard, 1993) and stereotactic inoculation into the brain (Le Gal La Salle *et al.*, 1993).

2. RETROVIRUSES

The retroviruses are a group of single-stranded RNA viruses characterized by an ability to convert their RNA to double-stranded DNA in infected cells by a process of reverse-transcription (Coffin, 1990). The resulting DNA then stably integrates into cellular chromosomes as a provirus and directs synthesis of viral proteins. The integration results in the retention of the viral gene sequences in the recipient cell and its descendants. The retroviral genome contains three genes, gag, pol, and env that code for capsid proteins, polymerase enzyme, and envelope components, respectively. A sequence found upstream from the gag gene contains a signal for packaging of the genome into virions. Two long terminal repeat (LTR) sequences are present at the 5' and 3' ends of the viral genome. These contain strong promoter and enhancer sequences and are also required for integration in the host cell genome (Coffin, 1990).

In order to construct a retroviral vector, a nucleic acid encoding one or more oligonucleotide or polynucleotide sequences of interest is inserted into the viral genome in the place of certain viral sequences to produce a virus that is replication-defective. In order to produce virions, a packaging cell line containing the gag, pol, and env genes but without the LTR and packaging components is constructed (Mann *et al.*, 1983). When a recombinant plasmid containing a cDNA, together with the retroviral LTR and packaging sequences is introduced into this cell line (by calcium phosphate precipitation for example), the packaging sequence allows the RNA transcript of the recombinant plasmid to be packaged into viral particles, which are then secreted into the culture media (Nicolas and Rubenstein, 1988; Temin, 1986; Mann *et al.*, 1983). The media containing the recombinant retroviruses is then collected, optionally concentrated, and used for gene transfer. Retroviral vectors are able to infect a broad variety of cell types. However, integration and stable expression require the division of host cells (Paskind *et al.*, 1975).

A novel approach designed to allow specific targeting of retrovirus vectors was recently developed based on the chemical modification of a retrovirus by the chemical addition of lactose residues to the viral envelope. This modification could permit the specific infection of hepatocytes *via* sialoglycoprotein receptors.

5 A different approach to targeting of recombinant retroviruses was designed in which biotinylated antibodies against a retroviral envelope protein and against a specific cell receptor were used. The antibodies were coupled *via* the biotin components by using streptavidin (Roux *et al.*, 1989). Using antibodies against major histocompatibility complex class I and class II antigens, they demonstrated the infection
10 of a variety of human cells that bore those surface antigens with an ecotropic virus *in vitro* (Roux *et al.*, 1989).

3. ADENO-ASSOCIATED VIRUSES

AAV (Ridgeway, 1988; Hermonat and Muzycka, 1984) is a parovirus, discovered as a contamination of adenoviral stocks. It is a ubiquitous virus (antibodies
15 are present in 85% of the US human population) that has not been linked to any disease. It is also classified as a dependovirus, because its replications is dependent on the presence of a helper virus, such as adenovirus. Five serotypes have been isolated, of which AAV-2 is the best characterized. AAV has a single-stranded linear DNA that is encapsidated into capsid proteins VP1, VP2 and VP3 to form an icosahedral virion of
20 20 to 24 nm in diameter (Muzycka and McLaughlin, 1988).

The AAV DNA is approximately 4.7 kilobases long. It contains two open reading frames and is flanked by two ITRs. There are two major genes in the AAV genome: *rep* and *cap*. The *rep* gene codes for proteins responsible for viral replications, whereas *cap* codes for capsid protein VP1-3. Each ITR forms a T-shaped
25 hairpin structure. These terminal repeats are the only essential *cis* components of the AAV for chromosomal integration. Therefore, the AAV can be used as a vector with all viral coding sequences removed and replaced by the cassette of genes for delivery. Three viral promoters have been identified and named p5, p19, and p40, according to their map position. Transcription from p5 and p19 results in production of rep proteins,

and transcription from p40 produces the capsid proteins (Hermonat and Muzyczka, 1984).

There are several factors that prompted researchers to study the possibility of using rAAV as an expression vector. One is that the requirements for delivering a gene to integrate into the host chromosome are surprisingly few. It is necessary to have the 145-bp ITRs, which are only 6% of the AAV genome. This leaves room in the vector to assemble a 4.5-kb DNA insertion. While this carrying capacity may prevent the AAV from delivering large genes, it is amply suited for delivering the antisense constructs of the present invention.

AAV is also a good choice of delivery vehicles due to its safety. There is a relatively complicated rescue mechanism: not only wild type adenovirus but also AAV genes are required to mobilize rAAV. Likewise, AAV is not pathogenic and not associated with any disease. The removal of viral coding sequences minimizes immune reactions to viral gene expression, and therefore, rAAV does not evoke an inflammatory response.

4. OTHER VIRAL VECTORS AS EXPRESSION CONSTRUCTS

Other viral vectors may be employed as expression constructs in the present invention for the delivery of oligonucleotide or polynucleotide sequences to a host cell. Vectors derived from viruses such as vaccinia virus (Ridgeway, 1988; Coupar *et al.*, 1988), lentiviruses, polio viruses and herpes viruses may be employed. They offer several attractive features for various mammalian cells (Friedmann, 1989; Ridgeway, 1988; Coupar *et al.*, 1988; Horwich *et al.*, 1990).

With the recent recognition of defective hepatitis B viruses, new insight was gained into the structure-function relationship of different viral sequences. *In vitro* studies showed that the virus could retain the ability for helper-dependent packaging and reverse transcription despite the deletion of up to 80% of its genome (Horwich *et al.*, 1990). This suggested that large portions of the genome could be replaced with foreign genetic material. The hepatotropism and persistence (integration) were particularly attractive properties for liver-directed gene transfer. Chang *et al.* (1991) introduced the chloramphenicol acetyltransferase (CAT) gene into duck hepatitis B

virus genome in the place of the polymerase, surface, and pre-surface coding sequences. It was cotransfected with wild-type virus into an avian hepatoma cell line. Culture media containing high titers of the recombinant virus were used to infect primary duckling hepatocytes. Stable CAT gene expression was detected for at least 24 days
5 after transfection (Chang *et al.*, 1991).

5. NON-VIRAL VECTORS

In order to effect expression of the oligonucleotide or polynucleotide sequences of the present invention, the expression construct must be delivered into a cell. This delivery may be accomplished *in vitro*, as in laboratory procedures for
10 transforming cells lines, or *in vivo* or *ex vivo*, as in the treatment of certain disease states. As described above, one preferred mechanism for delivery is *via* viral infection where the expression construct is encapsulated in an infectious viral particle.

Once the expression construct has been delivered into the cell the nucleic acid encoding the desired oligonucleotide or polynucleotide sequences may be
15 positioned and expressed at different sites. In certain embodiments, the nucleic acid encoding the construct may be stably integrated into the genome of the cell. This integration may be in the specific location and orientation *via* homologous recombination (gene replacement) or it may be integrated in a random, non-specific location (gene augmentation). In yet further embodiments, the nucleic acid may be
20 stably maintained in the cell as a separate, episomal segment of DNA. Such nucleic acid segments or "episomes" encode sequences sufficient to permit maintenance and replication independent of or in synchronization with the host cell cycle. How the expression construct is delivered to a cell and where in the cell the nucleic acid remains is dependent on the type of expression construct employed.

25 In certain embodiments of the invention, the expression construct comprising one or more oligonucleotide or polynucleotide sequences may simply consist of naked recombinant DNA or plasmids. Transfer of the construct may be performed by any of the methods mentioned above which physically or chemically permeabilize the cell membrane. This is particularly applicable for transfer *in vitro* but
30 it may be applied to *in vivo* use as well. Dubensky *et al.* (1984) successfully injected

polyomavirus DNA in the form of calcium phosphate precipitates into liver and spleen of adult and newborn mice demonstrating active viral replication and acute infection. Benvenisty and Reshef (1986) also demonstrated that direct intraperitoneal injection of calcium phosphate-precipitated plasmids results in expression of the transfected genes.

- 5 It is envisioned that DNA encoding a gene of interest may also be transferred in a similar manner *in vivo* and express the gene product.

Another embodiment of the invention for transferring a naked DNA expression construct into cells may involve particle bombardment. This method depends on the ability to accelerate DNA-coated microprojectiles to a high velocity
10 allowing them to pierce cell membranes and enter cells without killing them (Klein *et al.*, 1987). Several devices for accelerating small particles have been developed. One such device relies on a high voltage discharge to generate an electrical current, which in turn provides the motive force (Yang *et al.*, 1990). The microprojectiles used have consisted of biologically inert substances such as tungsten or gold beads.

- 15 Selected organs including the liver, skin, and muscle tissue of rats and mice have been bombarded *in vivo* (Yang *et al.*, 1990; Zelenin *et al.*, 1991). This may require surgical exposure of the tissue or cells, to eliminate any intervening tissue between the gun and the target organ, *i.e. ex vivo* treatment. Again, DNA encoding a particular gene may be delivered *via* this method and still be incorporated by the present
20 invention.

ANTISENSE OLIGONUCLEOTIDES

- The end result of the flow of genetic information is the synthesis of protein. DNA is transcribed by polymerases into messenger RNA and translated on the ribosome to yield a folded, functional protein. Thus there are several steps along the
25 route where protein synthesis can be inhibited. The native DNA segment coding for a polypeptide described herein, as all such mammalian DNA strands, has two strands: a sense strand and an antisense strand held together by hydrogen bonding. The messenger RNA coding for polypeptide has the same nucleotide sequence as the sense DNA strand except that the DNA thymidine is replaced by uridine. Thus, synthetic

antisense nucleotide sequences will bind to a mRNA and inhibit expression of the protein encoded by that mRNA.

The targeting of antisense oligonucleotides to mRNA is thus one mechanism to shut down protein synthesis, and, consequently, represents a powerful and targeted therapeutic approach. For example, the synthesis of polygalacturonase and the muscarine type 2 acetylcholine receptor are inhibited by antisense oligonucleotides directed to their respective mRNA sequences (U. S. Patent 5,739,119 and U. S. Patent 5,759,829, each specifically incorporated herein by reference in its entirety). Further, examples of antisense inhibition have been demonstrated with the nuclear protein cyclin, the multiple drug resistance gene (MDG1), ICAM-1, E-selectin, STK-1, striatal GABA_A receptor and human EGF (Jaskulski *et al.*, 1988; Vasanthakumar and Ahmed, 1989; Peris *et al.*, 1998; U. S. Patent 5,801,154; U. S. Patent 5,789,573; U. S. Patent 5,718,709 and U. S. Patent 5,610,288, each specifically incorporated herein by reference in its entirety). Antisense constructs have also been described that inhibit and can be used to treat a variety of abnormal cellular proliferations, *e.g.* cancer (U. S. Patent 5,747,470; U. S. Patent 5,591,317 and U. S. Patent 5,783,683, each specifically incorporated herein by reference in its entirety).

Therefore, in exemplary embodiments, the invention provides oligonucleotide sequences that comprise all, or a portion of, any sequence that is capable of specifically binding to polynucleotide sequence described herein, or a complement thereof. In one embodiment, the antisense oligonucleotides comprise DNA or derivatives thereof. In another embodiment, the oligonucleotides comprise RNA or derivatives thereof. In a third embodiment, the oligonucleotides are modified DNAs comprising a phosphorothioated modified backbone. In a fourth embodiment, the oligonucleotide sequences comprise peptide nucleic acids or derivatives thereof. In each case, preferred compositions comprise a sequence region that is complementary, and more preferably substantially-complementary, and even more preferably, completely complementary to one or more portions of polynucleotides disclosed herein.

Selection of antisense compositions specific for a given gene sequence is based upon analysis of the chosen target sequence (*i.e.* in these illustrative examples the rat and human sequences) and determination of secondary structure, T_m , binding

energy, relative stability, and antisense compositions were selected based upon their relative inability to form dimers, hairpins, or other secondary structures that would reduce or prohibit specific binding to the target mRNA in a host cell.

Highly preferred target regions of the mRNA, are those which are at or
5 near the AUG translation initiation codon, and those sequences which were substantially complementary to 5' regions of the mRNA. These secondary structure analyses and target site selection considerations were performed using v.4 of the OLIGO primer analysis software (Rychlik, 1997) and the BLASTN 2.0.5 algorithm software (Altschul *et al.*, 1997).

10 The use of an antisense delivery method employing a short peptide vector, termed MPG (27 residues), is also contemplated. The MPG peptide contains a hydrophobic domain derived from the fusion sequence of HIV gp41 and a hydrophilic domain from the nuclear localization sequence of SV40 T-antigen (Morris *et al.*, 1997). It has been demonstrated that several molecules of the MPG peptide coat the antisense
15 oligonucleotides and can be delivered into cultured mammalian cells in less than 1 hour with relatively high efficiency (90%). Further, the interaction with MPG strongly increases both the stability of the oligonucleotide to nuclease and the ability to cross the plasma membrane (Morris *et al.*, 1997).

RIBOZYMES

20 Although proteins traditionally have been used for catalysis of nucleic acids, another class of macromolecules has emerged as useful in this endeavor. Ribozymes are RNA-protein complexes that cleave nucleic acids in a site-specific fashion. Ribozymes have specific catalytic domains that possess endonuclease activity (Kim and Cech, 1987; Gerlach *et al.*, 1987; Forster and Symons, 1987). For example, a
25 large number of ribozymes accelerate phosphoester transfer reactions with a high degree of specificity, often cleaving only one of several phosphoesters in an oligonucleotide substrate (Cech *et al.*, 1981; Michel and Westhof, 1990; Reinhold-Hurek and Shub, 1992). This specificity has been attributed to the requirement that the substrate bind via specific base-pairing interactions to the internal guide sequence
30 ("IGS") of the ribozyme prior to chemical reaction.

Ribozyme catalysis has primarily been observed as part of sequence-specific cleavage/ligation reactions involving nucleic acids (Joyce, 1989; Cech *et al.*, 1981). For example, U. S. Patent No. 5,354,855 (specifically incorporated herein by reference) reports that certain ribozymes can act as endonucleases with a sequence
5 specificity greater than that of known ribonucleases and approaching that of the DNA restriction enzymes. Thus, sequence-specific ribozyme-mediated inhibition of gene expression may be particularly suited to therapeutic applications (Scanlon *et al.*, 1991; Sarver *et al.*, 1990). Recently, it was reported that ribozymes elicited genetic changes in some cells lines to which they were applied; the altered genes included the oncogenes
10 H-*ras*, c-*fos* and genes of HIV. Most of this work involved the modification of a target mRNA, based on a specific mutant codon that is cleaved by a specific ribozyme.

Six basic varieties of naturally-occurring enzymatic RNAs are known presently. Each can catalyze the hydrolysis of RNA phosphodiester bonds *in trans* (and thus can cleave other RNA molecules) under physiological conditions. In general,
15 enzymatic nucleic acids act by first binding to a target RNA. Such binding occurs through the target binding portion of a enzymatic nucleic acid which is held in close proximity to an enzymatic portion of the molecule that acts to cleave the target RNA. Thus, the enzymatic nucleic acid first recognizes and then binds a target RNA through complementary base-pairing, and once bound to the correct site, acts enzymatically to
20 cut the target RNA. Strategic cleavage of such a target RNA will destroy its ability to direct synthesis of an encoded protein. After an enzymatic nucleic acid has bound and cleaved its RNA target, it is released from that RNA to search for another target and can repeatedly bind and cleave new targets.

The enzymatic nature of a ribozyme is advantageous over many
25 technologies, such as antisense technology (where a nucleic acid molecule simply binds to a nucleic acid target to block its translation) since the concentration of ribozyme necessary to affect a therapeutic treatment is lower than that of an antisense oligonucleotide. This advantage reflects the ability of the ribozyme to act enzymatically. Thus, a single ribozyme molecule is able to cleave many molecules of
30 target RNA. In addition, the ribozyme is a highly specific inhibitor, with the specificity of inhibition depending not only on the base pairing mechanism of binding to the target

RNA, but also on the mechanism of target RNA cleavage. Single mismatches, or base-substitutions, near the site of cleavage can completely eliminate catalytic activity of a ribozyme. Similar mismatches in antisense molecules do not prevent their action (Woolf *et al.*, 1992). Thus, the specificity of action of a ribozyme is greater than that of
5 an antisense oligonucleotide binding the same RNA site.

The enzymatic nucleic acid molecule may be formed in a hammerhead, hairpin, a hepatitis δ virus, group I intron or RNaseP RNA (in association with an RNA guide sequence) or Neurospora VS RNA motif. Examples of hammerhead motifs are described by Rossi *et al.* (1992). Examples of hairpin motifs are described by Hampel
10 *et al.* (Eur. Pat. Appl. Publ. No. EP 0360257), Hampel and Tritz (1989), Hampel *et al.* (1990) and U. S. Patent 5,631,359 (specifically incorporated herein by reference). An example of the hepatitis δ virus motif is described by Perrotta and Been (1992); an example of the RNaseP motif is described by Guerrier-Takada *et al.* (1983); Neurospora VS RNA ribozyme motif is described by Collins (Saville and Collins,
15 1990; Saville and Collins, 1991; Collins and Olive, 1993); and an example of the Group I intron is described in (U. S. Patent 4,987,071, specifically incorporated herein by reference). All that is important in an enzymatic nucleic acid molecule of this invention is that it has a specific substrate binding site which is complementary to one or more of the target gene RNA regions, and that it have nucleotide sequences within or
20 surrounding that substrate binding site which impart an RNA cleaving activity to the molecule. Thus the ribozyme constructs need not be limited to specific motifs mentioned herein.

In certain embodiments, it may be important to produce enzymatic cleaving agents which exhibit a high degree of specificity for the RNA of a desired
25 target, such as one of the sequences disclosed herein. The enzymatic nucleic acid molecule is preferably targeted to a highly conserved sequence region of a target mRNA. Such enzymatic nucleic acid molecules can be delivered exogenously to specific cells as required. Alternatively, the ribozymes can be expressed from DNA or RNA vectors that are delivered to specific cells.

30 Small enzymatic nucleic acid motifs (*e.g.*, of the hammerhead or the hairpin structure) may also be used for exogenous delivery. The simple structure of

these molecules increases the ability of the enzymatic nucleic acid to invade targeted regions of the mRNA structure. Alternatively, catalytic RNA molecules can be expressed within cells from eukaryotic promoters (*e.g.*, Scanlon *et al.*, 1991; Kashani-Sabet *et al.*, 1992; Dropulic *et al.*, 1992; Weerasinghe *et al.*, 1991; Ojwang *et al.*, 1992; 5 Chen *et al.*, 1992; Sarver *et al.*, 1990). Those skilled in the art realize that any ribozyme can be expressed in eukaryotic cells from the appropriate DNA vector. The activity of such ribozymes can be augmented by their release from the primary transcript by a second ribozyme (Int. Pat. Appl. Publ. No. WO 93/23569, and Int. Pat. Appl. Publ. No. WO 94/02595, both hereby incorporated by reference; Ohkawa *et al.*, 10 1992; Taira *et al.*, 1991; and Ventura *et al.*, 1993).

Ribozymes may be added directly, or can be complexed with cationic lipids, lipid complexes, packaged within liposomes, or otherwise delivered to target cells. The RNA or RNA complexes can be locally administered to relevant tissues *ex vivo*, or *in vivo* through injection, aerosol inhalation, infusion pump or stent, with or 15 without their incorporation in biopolymers.

Ribozymes may be designed as described in Int. Pat. Appl. Publ. No. WO 93/23569 and Int. Pat. Appl. Publ. No. WO 94/02595, each specifically incorporated herein by reference) and synthesized to be tested *in vitro* and *in vivo*, as described. Such ribozymes can also be optimized for delivery. While specific 20 examples are provided, those in the art will recognize that equivalent RNA targets in other species can be utilized when necessary.

Hammerhead or hairpin ribozymes may be individually analyzed by computer folding (Jaeger *et al.*, 1989) to assess whether the ribozyme sequences fold into the appropriate secondary structure. Those ribozymes with unfavorable 25 intramolecular interactions between the binding arms and the catalytic core are eliminated from consideration. Varying binding arm lengths can be chosen to optimize activity. Generally, at least 5 or so bases on each arm are able to bind to, or otherwise interact with, the target RNA.

Ribozymes of the hammerhead or hairpin motif may be designed to 30 anneal to various sites in the mRNA message, and can be chemically synthesized. The method of synthesis used follows the procedure for normal RNA synthesis as described

in Usman *et al.* (1987) and in Scaringe *et al.* (1990) and makes use of common nucleic acid protecting and coupling groups, such as dimethoxytrityl at the 5'-end, and phosphoramidites at the 3'-end. Average stepwise coupling yields are typically >98%. Hairpin ribozymes may be synthesized in two parts and annealed to reconstruct an active ribozyme (Chowrira and Burke, 1992). Ribozymes may be modified extensively to enhance stability by modification with nuclease resistant groups, for example, 2'-amino, 2'-C-allyl, 2'-fluoro, 2'-o-methyl, 2'-H (for a review see *e.g.*, Usman and Cedergren, 1992). Ribozymes may be purified by gel electrophoresis using general methods or by high pressure liquid chromatography and resuspended in water.

Ribozyme activity can be optimized by altering the length of the ribozyme binding arms, or chemically synthesizing ribozymes with modifications that prevent their degradation by serum ribonucleases (see *e.g.*, Int. Pat. Appl. Publ. No. WO 92/07065; Perrault *et al.*, 1990; Pieken *et al.*, 1991; Usman and Cedergren, 1992; Int. Pat. Appl. Publ. No. WO 93/15187; Int. Pat. Appl. Publ. No. WO 91/03162; Eur. Pat. Appl. Publ. No. 92110298.4; U. S. Patent 5,334,711; and Int. Pat. Appl. Publ. No. WO 94/13688, which describe various chemical modifications that can be made to the sugar moieties of enzymatic RNA molecules), modifications which enhance their efficacy in cells, and removal of stem II bases to shorten RNA synthesis times and reduce chemical requirements.

Sullivan *et al.* (Int. Pat. Appl. Publ. No. WO 94/02595) describes the general methods for delivery of enzymatic RNA molecules. Ribozymes may be administered to cells by a variety of methods known to those familiar to the art, including, but not restricted to, encapsulation in liposomes, by iontophoresis, or by incorporation into other vehicles, such as hydrogels, cyclodextrins, biodegradable nanocapsules, and bioadhesive microspheres. For some indications, ribozymes may be directly delivered *ex vivo* to cells or tissues with or without the aforementioned vehicles. Alternatively, the RNA/vehicle combination may be locally delivered by direct inhalation, by direct injection or by use of a catheter, infusion pump or stent. Other routes of delivery include, but are not limited to, intravascular, intramuscular, subcutaneous or joint injection, aerosol inhalation, oral (tablet or pill form), topical, systemic, ocular, intraperitoneal and/or intrathecal delivery. More detailed descriptions

of ribozyme delivery and administration are provided in Int. Pat. Appl. Publ. No. WO 94/02595 and Int. Pat. Appl. Publ. No. WO 93/23569, each specifically incorporated herein by reference.

Another means of accumulating high concentrations of a ribozyme(s) within cells is to incorporate the ribozyme-encoding sequences into a DNA expression vector. Transcription of the ribozyme sequences are driven from a promoter for eukaryotic RNA polymerase I (pol I), RNA polymerase II (pol II), or RNA polymerase III (pol III). Transcripts from pol II or pol III promoters will be expressed at high levels in all cells; the levels of a given pol II promoter in a given cell type will depend on the nature of the gene regulatory sequences (enhancers, silencers, *etc.*) present nearby. Prokaryotic RNA polymerase promoters may also be used, providing that the prokaryotic RNA polymerase enzyme is expressed in the appropriate cells (Elroy-Stein and Moss, 1990; Gao and Huang, 1993; Lieber *et al.*, 1993; Zhou *et al.*, 1990). Ribozymes expressed from such promoters can function in mammalian cells (*e.g.* Kashani-Saber *et al.*, 1992; Ojwang *et al.*, 1992; Chen *et al.*, 1992; Yu *et al.*, 1993; L'Huillier *et al.*, 1992; Lisziewicz *et al.*, 1993). Such transcription units can be incorporated into a variety of vectors for introduction into mammalian cells, including but not restricted to, plasmid DNA vectors, viral DNA vectors (such as adenovirus or adeno-associated vectors), or viral RNA vectors (such as retroviral, semliki forest virus, sindbis virus vectors).

Ribozymes may be used as diagnostic tools to examine genetic drift and mutations within diseased cells. They can also be used to assess levels of the target RNA molecule. The close relationship between ribozyme activity and the structure of the target RNA allows the detection of mutations in any region of the molecule which alters the base-pairing and three-dimensional structure of the target RNA. By using multiple ribozymes, one may map nucleotide changes which are important to RNA structure and function *in vitro*, as well as in cells and tissues. Cleavage of target RNAs with ribozymes may be used to inhibit gene expression and define the role (essentially) of specified gene products in the progression of disease. In this manner, other genetic targets may be defined as important mediators of the disease. These studies will lead to better treatment of the disease progression by affording the possibility of combinational

therapies (*e.g.*, multiple ribozymes targeted to different genes, ribozymes coupled with known small molecule inhibitors, or intermittent treatment with combinations of ribozymes and/or other chemical or biological molecules). Other *in vitro* uses of ribozymes are well known in the art, and include detection of the presence of mRNA associated with an IL-5 related condition. Such RNA is detected by determining the presence of a cleavage product after treatment with a ribozyme using standard methodology.

PEPTIDE NUCLEIC ACIDS

In certain embodiments, the inventors contemplate the use of peptide nucleic acids (PNAs) in the practice of the methods of the invention. PNA is a DNA mimic in which the nucleobases are attached to a pseudopeptide backbone (Good and Nielsen, 1997). PNA is able to be utilized in a number methods that traditionally have used RNA or DNA. Often PNA sequences perform better in techniques than the corresponding RNA or DNA sequences and have utilities that are not inherent to RNA or DNA. A review of PNA including methods of making, characteristics of, and methods of using, is provided by Corey (1997) and is incorporated herein by reference. As such, in certain embodiments, one may prepare PNA sequences that are complementary to one or more portions of the ACE mRNA sequence, and such PNA compositions may be used to regulate, alter, decrease, or reduce the translation of ACE-specific mRNA, and thereby alter the level of ACE activity in a host cell to which such PNA compositions have been administered.

PNAs have 2-aminoethyl-glycine linkages replacing the normal phosphodiester backbone of DNA (Nielsen *et al.*, 1991; Hanvey *et al.*, 1992; Hyrup and Nielsen, 1996; Neilsen, 1996). This chemistry has three important consequences: firstly, in contrast to DNA or phosphorothioate oligonucleotides, PNAs are neutral molecules; secondly, PNAs are achiral, which avoids the need to develop a stereoselective synthesis; and thirdly, PNA synthesis uses standard Boc (Dueholm *et al.*, 1994) or Fmoc (Thomson *et al.*, 1995) protocols for solid-phase peptide synthesis, although other methods, including a modified Merrifield method, have been used (Christensen *et al.*, 1995).

PNA monomers or ready-made oligomers are commercially available from PerSeptive Biosystems (Framingham, MA). PNA syntheses by either Boc or Fmoc protocols are straightforward using manual or automated protocols (Norton *et al.*, 1995). The manual protocol lends itself to the production of chemically modified PNAs or the simultaneous synthesis of families of closely related PNAs.

As with peptide synthesis, the success of a particular PNA synthesis will depend on the properties of the chosen sequence. For example, while in theory PNAs can incorporate any combination of nucleotide bases, the presence of adjacent purines can lead to deletions of one or more residues in the product. In expectation of this difficulty, it is suggested that, in producing PNAs with adjacent purines, one should repeat the coupling of residues likely to be added inefficiently. This should be followed by the purification of PNAs by reverse-phase high-pressure liquid chromatography (Norton *et al.*, 1995) providing yields and purity of product similar to those observed during the synthesis of peptides.

Modifications of PNAs for a given application may be accomplished by coupling amino acids during solid-phase synthesis or by attaching compounds that contain a carboxylic acid group to the exposed N-terminal amine. Alternatively, PNAs can be modified after synthesis by coupling to an introduced lysine or cysteine. The ease with which PNAs can be modified facilitates optimization for better solubility or for specific functional requirements. Once synthesized, the identity of PNAs and their derivatives can be confirmed by mass spectrometry. Several studies have made and utilized modifications of PNAs (Norton *et al.*, 1995; Haaime *et al.*, 1996; Stetsenko *et al.*, 1996; Petersen *et al.*, 1995; Ulmann *et al.*, 1996; Koch *et al.*, 1995; Orum *et al.*, 1995; Footer *et al.*, 1996; Griffith *et al.*, 1995; Kremsky *et al.*, 1996; Pardridge *et al.*, 1995; Boffa *et al.*, 1995; Landsdorp *et al.*, 1996; Gambacorti-Passerini *et al.*, 1996; Armitage *et al.*, 1997; Seeger *et al.*, 1997; Ruskowski *et al.*, 1997). U.S. Patent No. 5,700,922 discusses PNA-DNA-PNA chimeric molecules and their uses in diagnostics, modulating protein in organisms, and treatment of conditions susceptible to therapeutics.

In contrast to DNA and RNA, which contain negatively charged linkages, the PNA backbone is neutral. In spite of this dramatic alteration, PNAs

recognize complementary DNA and RNA by Watson-Crick pairing (Egholm *et al.*, 1993), validating the initial modeling by Nielsen *et al.* (1991). PNAs lack 3' to 5' polarity and can bind in either parallel or antiparallel fashion, with the antiparallel mode being preferred (Egholm *et al.*, 1993).

5 Hybridization of DNA oligonucleotides to DNA and RNA is destabilized by electrostatic repulsion between the negatively charged phosphate backbones of the complementary strands. By contrast, the absence of charge repulsion in PNA-DNA or PNA-RNA duplexes increases the melting temperature (T_m) and reduces the dependence of T_m on the concentration of mono- or divalent cations
10 (Nielsen *et al.*, 1991). The enhanced rate and affinity of hybridization are significant because they are responsible for the surprising ability of PNAs to perform strand invasion of complementary sequences within relaxed double-stranded DNA. In addition, the efficient hybridization at inverted repeats suggests that PNAs can recognize secondary structure effectively within double-stranded DNA. Enhanced
15 recognition also occurs with PNAs immobilized on surfaces, and Wang *et al.* have shown that support-bound PNAs can be used to detect hybridization events (Wang *et al.*, 1996).

One might expect that tight binding of PNAs to complementary sequences would also increase binding to similar (but not identical) sequences, reducing
20 the sequence specificity of PNA recognition. As with DNA hybridization, however, selective recognition can be achieved by balancing oligomer length and incubation temperature. Moreover, selective hybridization of PNAs is encouraged by PNA-DNA hybridization being less tolerant of base mismatches than DNA-DNA hybridization. For example, a single mismatch within a 16 bp PNA-DNA duplex can reduce the T_m by
25 up to 15°C (Egholm *et al.*, 1993). This high level of discrimination has allowed the development of several PNA-based strategies for the analysis of point mutations (Wang *et al.*, 1996; Carlsson *et al.*, 1996; Thiede *et al.*, 1996; Webb and Hurskainen, 1996; Perry-O'Keefe *et al.*, 1996).

High-affinity binding provides clear advantages for molecular
30 recognition and the development of new applications for PNAs. For example, 11-13 nucleotide PNAs inhibit the activity of telomerase, a ribonucleo-protein that extends

telomere ends using an essential RNA template, while the analogous DNA oligomers do not (Norton *et al.*, 1996).

Neutral PNAs are more hydrophobic than analogous DNA oligomers, and this can lead to difficulty solubilizing them at neutral pH, especially if the PNAs have a high purine content or if they have the potential to form secondary structures. Their solubility can be enhanced by attaching one or more positive charges to the PNA termini (Nielsen *et al.*, 1991).

Findings by Allfrey and colleagues suggest that strand invasion will occur spontaneously at sequences within chromosomal DNA (Boffa *et al.*, 1995; Boffa *et al.*, 1996). These studies targeted PNAs to triplet repeats of the nucleotides CAG and used this recognition to purify transcriptionally active DNA (Boffa *et al.*, 1995) and to inhibit transcription (Boffa *et al.*, 1996). This result suggests that if PNAs can be delivered within cells then they will have the potential to be general sequence-specific regulators of gene expression. Studies and reviews concerning the use of PNAs as antisense and anti-gene agents include Nielsen *et al.* (1993b), Hanvey *et al.* (1992), and Good and Nielsen (1997). Koppelhus *et al.* (1997) have used PNAs to inhibit HIV-1 inverse transcription, showing that PNAs may be used for antiviral therapies.

Methods of characterizing the antisense binding properties of PNAs are discussed in Rose (1993) and Jensen *et al.* (1997). Rose uses capillary gel electrophoresis to determine binding of PNAs to their complementary oligonucleotide, measuring the relative binding kinetics and stoichiometry. Similar types of measurements were made by Jensen *et al.* using BIAcore™ technology.

Other applications of PNAs include use in DNA strand invasion (Nielsen *et al.*, 1991), antisense inhibition (Hanvey *et al.*, 1992), mutational analysis (Orum *et al.*, 1993), enhancers of transcription (Mollegaard *et al.*, 1994), nucleic acid purification (Orum *et al.*, 1995), isolation of transcriptionally active genes (Boffa *et al.*, 1995), blocking of transcription factor binding (Vickers *et al.*, 1995), genome cleavage (Veselkov *et al.*, 1996), biosensors (Wang *et al.*, 1996), *in situ* hybridization (Thisted *et al.*, 1996), and in a alternative to Southern blotting (Perry-O'Keefe, 1996).

POLYPEPTIDE COMPOSITIONS

The present invention, in other aspects, provides polypeptide compositions. Generally, a polypeptide of the invention will be an isolated polypeptide (or an epitope, variant, or active fragment thereof) derived from a mammalian species.

5 Preferably, the polypeptide is encoded by a polynucleotide sequence disclosed herein or a sequence which hybridizes under moderately stringent conditions to a polynucleotide sequence disclosed herein. Alternatively, the polypeptide may be defined as a polypeptide which comprises a contiguous amino acid sequence from an amino acid sequence disclosed herein, or which polypeptide comprises an entire amino acid

10 sequence disclosed herein.

In the present invention, a polypeptide composition is also understood to comprise one or more polypeptides that are immunologically reactive with antibodies generated against a polypeptide of the invention, particularly a polypeptide having the amino acid sequence disclosed in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806

15 or 809, or to active fragments, or to variants or biological functional equivalents thereof.

Likewise, a polypeptide composition of the present invention is understood to comprise one or more polypeptides that are capable of eliciting antibodies that are immunologically reactive with one or more polypeptides encoded by one or

20 more contiguous nucleic acid sequences contained in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266,

25 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826, or to active fragments, or to variants thereof, or to one or more nucleic acid sequences which hybridize to one or more of these sequences under conditions of moderate to high stringency. Particularly illustrative polypeptides include the amino acid sequences disclosed in SEQ ID NO:

30 786, 787, 791, 793, 795, 797-799, 806, 809 and 827.

As used herein, an active fragment of a polypeptide includes a whole or a portion of a polypeptide which is modified by conventional techniques, *e.g.*, mutagenesis, or by addition, deletion, or substitution, but which active fragment exhibits substantially the same structure function, antigenicity, etc., as a polypeptide as described herein.

In certain illustrative embodiments, the polypeptides of the invention will comprise at least an immunogenic portion of a lung tumor protein or a variant thereof, as described herein. As noted above, a "lung tumor protein" is a protein that is expressed by lung tumor cells. Proteins that are lung tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with lung cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a lung tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well

known techniques. An immunogenic portion of a native lung tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (e.g., in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native lung tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native lung tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (e.g., 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants encompassed by the present invention include those exhibiting at least about 70%, 75%, 80%, 85%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, or 99% or more identity (determined as described above) to the polypeptides disclosed herein.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another

amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein, which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, and higher eukaryotic cells, such as mammalian cells and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian

cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange
5 resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having less than about 100 amino acids, and generally less than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such
10 polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. *See Merrifield, J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems
15 Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known
20 tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be
25 selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a
30 recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide

components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase.

- 5 This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea *et al.*, *Gene* 40:39-46, 1985; Murphy *et al.*, *Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

- 30 Fusion proteins are also provided. Such proteins comprise a polypeptide as described herein together with an unrelated immunogenic protein. Preferably the

immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is
5 derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred
10 embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different
15 fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292,
20 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins
25 containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology* 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

30 In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that

is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is
5 considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a lung tumor protein. As
10 used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a lung tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a lung tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may
15 be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be
20 determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as lung cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a lung tumor protein will generate a signal indicating the presence of a cancer in at least about
25 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, sputum, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein
30 for the presence of polypeptides that bind to the binding agent. It will be apparent that a

statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

5 Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.,* Harlow
10 and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide
15 is initially injected into any of a wide variety of mammals (*e.g.,* mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The
20 immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

25 Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.,* reactivity with the polypeptide of interest). Such cell lines may
30 be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a

myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid
5 cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

10 Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by
15 conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be
20 prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

25 Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers
30 include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria

toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A
5 direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

10 Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in
15 chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker
20 group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell *et al.*

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a
25 linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter *et al.*), by hydrolysis of
30 derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn *et al.*), by

serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell *et al.*), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler *et al.*).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In
5 another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers that provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

10 A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato *et al.*), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih *et al.*). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a
15 liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur
20 atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison *et al.* discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous,
25 intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a lung tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the Isolex™ System, available from Nexell Therapeutics, Inc. (Irvine, CA; see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a lung tumor polypeptide, polynucleotide encoding a lung tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a lung tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a lung tumor polypeptide if the T cells specifically proliferate, secrete cytokines or kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen *et al.*, *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a lung tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard

cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN- γ) is indicative of T cell activation (*see* Coligan *et al.*, Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a lung tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Lung tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from a patient, a related donor or an unrelated donor, and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a lung tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a lung tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a lung tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a lung tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS

In additional embodiments, the present invention concerns formulation of one or more of the polynucleotide, polypeptide, T-cell and/or antibody compositions disclosed herein in pharmaceutically-acceptable solutions for administration to a cell or an animal, either alone, or in combination with one or more other modalities of therapy.

It will also be understood that, if desired, the nucleic acid segment, RNA, DNA or PNA compositions that express a polypeptide as disclosed herein may be administered in combination with other agents as well, such as, *e.g.*, other proteins or polypeptides or various pharmaceutically-active agents. In fact, there is virtually no limit to other components that may also be included, given that the additional agents do not cause a significant adverse effect upon contact with the target cells or host tissues. The compositions may thus be delivered along with various other agents as required in

the particular instance. Such compositions may be purified from host cells or other biological sources, or alternatively may be chemically synthesized as described herein. Likewise, such compositions may further comprise substituted or derivatized RNA or DNA compositions.

- 5 Formulation of pharmaceutically-acceptable excipients and carrier solutions is well-known to those of skill in the art, as is the development of suitable dosing and treatment regimens for using the particular compositions described herein in a variety of treatment regimens, including *e.g.*, oral, parenteral, intravenous, intranasal, and intramuscular administration and formulation.

10 1. ORAL DELIVERY

 In certain applications, the pharmaceutical compositions disclosed herein may be delivered *via* oral administration to an animal. As such, these compositions may be formulated with an inert diluent or with an assimilable edible carrier, or they may be enclosed in hard- or soft-shell gelatin capsule, or they may be compressed into
15 tablets, or they may be incorporated directly with the food of the diet.

 The active compounds may even be incorporated with excipients and used in the form of ingestible tablets, buccal tables, troches, capsules, elixirs, suspensions, syrups, wafers, and the like (Mathiowitz *et al.*, 1997; Hwang *et al.*, 1998; U. S. Patent 5,641,515; U. S. Patent 5,580,579 and U. S. Patent 5,792,451, each
20 specifically incorporated herein by reference in its entirety). The tablets, troches, pills, capsules and the like may also contain the following: a binder, as gum tragacanth, acacia, cornstarch, or gelatin; excipients, such as dicalcium phosphate; a disintegrating agent, such as corn starch, potato starch, alginic acid and the like; a lubricant, such as magnesium stearate; and a sweetening agent, such as sucrose, lactose or saccharin may
25 be added or a flavoring agent, such as peppermint, oil of wintergreen, or cherry flavoring. When the dosage unit form is a capsule, it may contain, in addition to materials of the above type, a liquid carrier. Various other materials may be present as coatings or to otherwise modify the physical form of the dosage unit. For instance, tablets, pills, or capsules may be coated with shellac, sugar, or both. A syrup of elixir
30 may contain the active compound sucrose as a sweetening agent methyl and

propylparabens as preservatives, a dye and flavoring, such as cherry or orange flavor. Of course, any material used in preparing any dosage unit form should be pharmaceutically pure and substantially non-toxic in the amounts employed. In addition, the active compounds may be incorporated into sustained-release preparation
5 and formulations.

Typically, these formulations may contain at least about 0.1% of the active compound or more, although the percentage of the active ingredient(s) may, of course, be varied and may conveniently be between about 1 or 2% and about 60% or 70% or more of the weight or volume of the total formulation. Naturally, the amount of
10 active compound(s) in each therapeutically useful composition may be prepared in such a way that a suitable dosage will be obtained in any given unit dose of the compound. Factors such as solubility, bioavailability, biological half-life, route of administration, product shelf life, as well as other pharmacological considerations will be contemplated by one skilled in the art of preparing such pharmaceutical formulations, and as such, a
15 variety of dosages and treatment regimens may be desirable.

For oral administration the compositions of the present invention may alternatively be incorporated with one or more excipients in the form of a mouthwash, dentifrice, buccal tablet, oral spray, or sublingual orally-administered formulation. For example, a mouthwash may be prepared incorporating the active ingredient in the
20 required amount in an appropriate solvent, such as a sodium borate solution (Dobell's Solution). Alternatively, the active ingredient may be incorporated into an oral solution such as one containing sodium borate, glycerin and potassium bicarbonate, or dispersed in a dentifrice, or added in a therapeutically-effective amount to a composition that may include water, binders, abrasives, flavoring agents, foaming agents, and humectants.
25 Alternatively the compositions may be fashioned into a tablet or solution form that may be placed under the tongue or otherwise dissolved in the mouth.

2. INJECTABLE DELIVERY

In certain circumstances it will be desirable to deliver the pharmaceutical compositions disclosed herein parenterally, intravenously, intramuscularly, or even
30 intraperitoneally as described in U. S. Patent 5,543,158; U. S. Patent 5,641,515 and U.

S. Patent 5,399,363 (each specifically incorporated herein by reference in its entirety). Solutions of the active compounds as free base or pharmacologically acceptable salts may be prepared in water suitably mixed with a surfactant, such as hydroxypropylcellulose. Dispersions may also be prepared in glycerol, liquid
5 polyethylene glycols, and mixtures thereof and in oils. Under ordinary conditions of storage and use, these preparations contain a preservative to prevent the growth of microorganisms.

The pharmaceutical forms suitable for injectable use include sterile aqueous solutions or dispersions and sterile powders for the extemporaneous
10 preparation of sterile injectable solutions or dispersions (U. S. Patent 5,466,468, specifically incorporated herein by reference in its entirety). In all cases the form must be sterile and must be fluid to the extent that easy syringability exists. It must be stable under the conditions of manufacture and storage and must be preserved against the contaminating action of microorganisms, such as bacteria and fungi. The carrier can be
15 a solvent or dispersion medium containing, for example, water, ethanol, polyol (*e.g.*, glycerol, propylene glycol, and liquid polyethylene glycol, and the like), suitable mixtures thereof, and/or vegetable oils. Proper fluidity may be maintained, for example, by the use of a coating, such as lecithin, by the maintenance of the required particle size in the case of dispersion and by the use of surfactants. The prevention of
20 the action of microorganisms can be facilitated by various antibacterial and antifungal agents, for example, parabens, chlorobutanol, phenol, sorbic acid, thimerosal, and the like. In many cases, it will be preferable to include isotonic agents, for example, sugars or sodium chloride. Prolonged absorption of the injectable compositions can be brought about by the use in the compositions of agents delaying absorption, for
25 example, aluminum monostearate and gelatin.

For parenteral administration in an aqueous solution, for example, the solution should be suitably buffered if necessary and the liquid diluent first rendered isotonic with sufficient saline or glucose. These particular aqueous solutions are especially suitable for intravenous, intramuscular, subcutaneous and intraperitoneal
30 administration. In this connection, a sterile aqueous medium that can be employed will be known to those of skill in the art in light of the present disclosure. For example, one

dosage may be dissolved in 1 ml of isotonic NaCl solution and either added to 1000 ml of hypodermoclysis fluid or injected at the proposed site of infusion, (see for example, "Remington's Pharmaceutical Sciences" 15th Edition, pages 1035-1038 and 1570-1580). Some variation in dosage will necessarily occur depending on the condition of the subject being treated. The person responsible for administration will, in any event, determine the appropriate dose for the individual subject. Moreover, for human administration, preparations should meet sterility, pyrogenicity, and the general safety and purity standards as required by FDA Office of Biologics standards.

Sterile injectable solutions are prepared by incorporating the active compounds in the required amount in the appropriate solvent with various of the other ingredients enumerated above, as required, followed by filtered sterilization. Generally, dispersions are prepared by incorporating the various sterilized active ingredients into a sterile vehicle which contains the basic dispersion medium and the required other ingredients from those enumerated above. In the case of sterile powders for the preparation of sterile injectable solutions, the preferred methods of preparation are vacuum-drying and freeze-drying techniques which yield a powder of the active ingredient plus any additional desired ingredient from a previously sterile-filtered solution thereof.

The compositions disclosed herein may be formulated in a neutral or salt form. Pharmaceutically-acceptable salts, include the acid addition salts (formed with the free amino groups of the protein) and which are formed with inorganic acids such as, for example, hydrochloric or phosphoric acids, or such organic acids as acetic, oxalic, tartaric, mandelic, and the like. Salts formed with the free carboxyl groups can also be derived from inorganic bases such as, for example, sodium, potassium, ammonium, calcium, or ferric hydroxides, and such organic bases as isopropylamine, trimethylamine, histidine, procaine and the like. Upon formulation, solutions will be administered in a manner compatible with the dosage formulation and in such amount as is therapeutically effective. The formulations are easily administered in a variety of dosage forms such as injectable solutions, drug-release capsules, and the like.

As used herein, "carrier" includes any and all solvents, dispersion media, vehicles, coatings, diluents, antibacterial and antifungal agents, isotonic and absorption

delaying agents, buffers, carrier solutions, suspensions, colloids, and the like. The use of such media and agents for pharmaceutical active substances is well known in the art. Except insofar as any conventional media or agent is incompatible with the active ingredient, its use in the therapeutic compositions is contemplated. Supplementary
5 active ingredients can also be incorporated into the compositions.

The phrase "pharmaceutically-acceptable" refers to molecular entities and compositions that do not produce an allergic or similar untoward reaction when administered to a human. The preparation of an aqueous composition that contains a protein as an active ingredient is well understood in the art. Typically, such
10 compositions are prepared as injectables, either as liquid solutions or suspensions; solid forms suitable for solution in, or suspension in, liquid prior to injection can also be prepared. The preparation can also be emulsified.

3. NASAL DELIVERY

In certain embodiments, the pharmaceutical compositions may be
15 delivered by intranasal sprays, inhalation, and/or other aerosol delivery vehicles. Methods for delivering genes, nucleic acids, and peptide compositions directly to the lungs *via* nasal aerosol sprays has been described *e.g.*, in U. S. Patent 5,756,353 and U. S. Patent 5,804,212 (each specifically incorporated herein by reference in its entirety). Likewise, the delivery of drugs using intranasal microparticle resins (Takenaga *et al.*,
20 1998) and lysophosphatidyl-glycerol compounds (U. S. Patent 5,725,871, specifically incorporated herein by reference in its entirety) are also well-known in the pharmaceutical arts. Likewise, transmucosal drug delivery in the form of a polytetrafluoroethylene support matrix is described in U. S. Patent 5,780,045 (specifically incorporated herein by reference in its entirety).

25 4. LIPOSOME-, NANOCAPSULE-, AND MICROPARTICLE-MEDIATED DELIVERY

In certain embodiments, the inventors contemplate the use of liposomes, nanocapsules, microparticles, microspheres, lipid particles, vesicles, and the like, for the introduction of the compositions of the present invention into suitable host cells. In particular, the compositions of the present invention may be formulated for delivery

either encapsulated in a lipid particle, a liposome, a vesicle, a nanosphere, or a nanoparticle or the like.

Such formulations may be preferred for the introduction of pharmaceutically-acceptable formulations of the nucleic acids or constructs disclosed herein. The formation and use of liposomes is generally known to those of skill in the art (see for example, Couvreur *et al.*, 1977; Couvreur, 1988; Lasic, 1998; which describes the use of liposomes and nanocapsules in the targeted antibiotic therapy for intracellular bacterial infections and diseases). Recently, liposomes were developed with improved serum stability and circulation half-times (Gabizon and Papahadjopoulos, 1988; Allen and Choun, 1987; U. S. Patent 5,741,516, specifically incorporated herein by reference in its entirety). Further, various methods of liposome and liposome like preparations as potential drug carriers have been reviewed (Takakura, 1998; Chandran *et al.*, 1997; Margalit, 1995; U. S. Patent 5,567,434; U. S. Patent 5,552,157; U. S. Patent 5,565,213; U. S. Patent 5,738,868 and U. S. Patent 5,795,587, each specifically incorporated herein by reference in its entirety).

Liposomes have been used successfully with a number of cell types that are normally resistant to transfection by other procedures including T cell suspensions, primary hepatocyte cultures and PC 12 cells (Renneisen *et al.*, 1990; Muller *et al.*, 1990). In addition, liposomes are free of the DNA length constraints that are typical of viral-based delivery systems. Liposomes have been used effectively to introduce genes, drugs (Heath and Martin, 1986; Heath *et al.*, 1986; Balazsovits *et al.*, 1989; Fresta and Puglisi, 1996), radiotherapeutic agents (Pikul *et al.*, 1987), enzymes (Imaizumi *et al.*, 1990a; Imaizumi *et al.*, 1990b), viruses (Faller and Baltimore, 1984), transcription factors and allosteric effectors (Nicolau and Gersonde, 1979) into a variety of cultured cell lines and animals. In addition, several successful clinical trials examining the effectiveness of liposome-mediated drug delivery have been completed (Lopez-Berestein *et al.*, 1985a; 1985b; Coune, 1988; Sculier *et al.*, 1988). Furthermore, several studies suggest that the use of liposomes is not associated with autoimmune responses, toxicity or gonadal localization after systemic delivery (Mori and Fukatsu, 1992).

Liposomes are formed from phospholipids that are dispersed in an aqueous medium and spontaneously form multilamellar concentric bilayer vesicles

(also termed multilamellar vesicles (MLVs). MLVs generally have diameters of from 25 nm to 4 μ m. Sonication of MLVs results in the formation of small unilamellar vesicles (SUVs) with diameters in the range of 200 to 500 Å, containing an aqueous solution in the core.

5 Liposomes bear resemblance to cellular membranes and are contemplated for use in connection with the present invention as carriers for the peptide compositions. They are widely suitable as both water- and lipid-soluble substances can be entrapped, *i.e.* in the aqueous spaces and within the bilayer itself, respectively. It is possible that the drug-bearing liposomes may even be employed for site-specific
10 delivery of active agents by selectively modifying the liposomal formulation.

 In addition to the teachings of Couvreur *et al.* (1977; 1988), the following information may be utilized in generating liposomal formulations. Phospholipids can form a variety of structures other than liposomes when dispersed in water, depending on the molar ratio of lipid to water. At low ratios the liposome is the
15 preferred structure. The physical characteristics of liposomes depend on pH, ionic strength and the presence of divalent cations. Liposomes can show low permeability to ionic and polar substances, but at elevated temperatures undergo a phase transition which markedly alters their permeability. The phase transition involves a change from a closely packed, ordered structure, known as the gel state, to a loosely packed, less-
20 ordered structure, known as the fluid state. This occurs at a characteristic phase-transition temperature and results in an increase in permeability to ions, sugars and drugs.

 In addition to temperature, exposure to proteins can alter the permeability of liposomes. Certain soluble proteins, such as cytochrome c, bind,
25 deform and penetrate the bilayer, thereby causing changes in permeability. Cholesterol inhibits this penetration of proteins, apparently by packing the phospholipids more tightly. It is contemplated that the most useful liposome formations for antibiotic and inhibitor delivery will contain cholesterol.

 The ability to trap solutes varies between different types of liposomes.
30 For example, MLVs are moderately efficient at trapping solutes, but SUVs are extremely inefficient. SUVs offer the advantage of homogeneity and reproducibility in

size distribution, however, and a compromise between size and trapping efficiency is offered by large unilamellar vesicles (LUVs). These are prepared by ether evaporation and are three to four times more efficient at solute entrapment than MLVs.

In addition to liposome characteristics, an important determinant in
5 entrapping compounds is the physicochemical properties of the compound itself. Polar compounds are trapped in the aqueous spaces and nonpolar compounds bind to the lipid bilayer of the vesicle. Polar compounds are released through permeation or when the bilayer is broken, but nonpolar compounds remain affiliated with the bilayer unless it is disrupted by temperature or exposure to lipoproteins. Both types show maximum
10 efflux rates at the phase transition temperature.

Liposomes interact with cells *via* four different mechanisms: endocytosis by phagocytic cells of the reticuloendothelial system such as macrophages and neutrophils; adsorption to the cell surface, either by nonspecific weak hydrophobic or electrostatic forces, or by specific interactions with cell-surface components; fusion
15 with the plasma cell membrane by insertion of the lipid bilayer of the liposome into the plasma membrane, with simultaneous release of liposomal contents into the cytoplasm; and by transfer of liposomal lipids to cellular or subcellular membranes, or vice versa, without any association of the liposome contents. It often is difficult to determine which mechanism is operative and more than one may operate at the same time.

20 The fate and disposition of intravenously injected liposomes depend on their physical properties, such as size, fluidity, and surface charge. They may persist in tissues for h or days, depending on their composition, and half lives in the blood range from min to several h. Larger liposomes, such as MLVs and LUVs, are taken up rapidly by phagocytic cells of the reticuloendothelial system, but physiology of the
25 circulatory system restrains the exit of such large species at most sites. They can exit only in places where large openings or pores exist in the capillary endothelium, such as the sinusoids of the liver or spleen. Thus, these organs are the predominate site of uptake. On the other hand, SUVs show a broader tissue distribution but still are sequestered highly in the liver and spleen. In general, this *in vivo* behavior limits the
30 potential targeting of liposomes to only those organs and tissues accessible to their large size. These include the blood, liver, spleen, bone marrow, and lymphoid organs.

Targeting is generally not a limitation in terms of the present invention. However, should specific targeting be desired, methods are available for this to be accomplished. Antibodies may be used to bind to the liposome surface and to direct the antibody and its drug contents to specific antigenic receptors located on a particular cell-type surface. Carbohydrate determinants (glycoprotein or glycolipid cell-surface components that play a role in cell-cell recognition, interaction and adhesion) may also be used as recognition sites as they have potential in directing liposomes to particular cell types. Mostly, it is contemplated that intravenous injection of liposomal preparations would be used, but other routes of administration are also conceivable.

Alternatively, the invention provides for pharmaceutically-acceptable nanocapsule formulations of the compositions of the present invention. Nanocapsules can generally entrap compounds in a stable and reproducible way (Henry-Michelland *et al.*, 1987; Quintanar-Guerrero *et al.*, 1998; Douglas *et al.*, 1987). To avoid side effects due to intracellular polymeric overloading, such ultrafine particles (sized around 0.1 μm) should be designed using polymers able to be degraded *in vivo*. Biodegradable polyalkyl-cyanoacrylate nanoparticles that meet these requirements are contemplated for use in the present invention. Such particles may be easily made, as described (Couvreur *et al.*, 1980; 1988; zur Muhlen *et al.*, 1998; Zambaux *et al.* 1998; Pinto-Alphandry *et al.*, 1995 and U. S. Patent 5,145,684, specifically incorporated herein by reference in its entirety).

IMMUNOGENIC COMPOSITIONS

In certain preferred embodiments of the present invention, immunogenic compositions, or vaccines, are provided. The immunogenic compositions will generally comprise one or more pharmaceutical compositions, such as those discussed above, in combination with an immunostimulant. An immunostimulant may be any substance that enhances or potentiates an immune response (antibody and/or cell-mediated) to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine

Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995).
Pharmaceutical compositions and immunogenic compositions, or vaccines, within the
scope of the present invention may also contain other compounds, which may be
biologically active or inactive. For example, one or more immunogenic portions of
5 other tumor antigens may be present, either incorporated into a fusion polypeptide or as
a separate compound, within the composition.

Illustrative immunogenic compositions may contain DNA encoding one
or more of the polypeptides as described above, such that the polypeptide is generated
in situ. As noted above, the DNA may be present within any of a variety of delivery
10 systems known to those of ordinary skill in the art, including nucleic acid expression
systems, bacteria and viral expression systems. Numerous gene delivery techniques are
well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug
Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic
acid expression systems contain the necessary DNA sequences for expression in the
15 patient (such as a suitable promoter and terminating signal). Bacterial delivery systems
involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that
expresses an immunogenic portion of the polypeptide on its cell surface or secretes such
an epitope. In a preferred embodiment, the DNA may be introduced using a viral
expression system (*e.g.*, vaccinia or other pox virus, retrovirus, or adenovirus), which
20 may involve the use of a non-pathogenic (defective), replication competent virus.
Suitable systems are disclosed, for example, in Fisher-Hoch *et al.*, *Proc. Natl. Acad.
Sci. USA* 86:317-321, 1989; Flexner *et al.*, *Ann. N.Y. Acad. Sci.* 569:86-103, 1989;
Flexner *et al.*, *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and
5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242;
25 WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld *et al.*, *Science*
252:431-434, 1991; Kolls *et al.*, *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994;
Kass-Eisler *et al.*, *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman *et al.*,
Circulation 88:2838-2848, 1993; and Guzman *et al.*, *Cir. Res.* 73:1202-1207, 1993.
Techniques for incorporating DNA into such expression systems are well known to
30 those of ordinary skill in the art. The DNA may also be "naked," as described, for
example, in Ulmer *et al.*, *Science* 259:1745-1749, 1993 and reviewed by Cohen,

Science 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells. It will be apparent that an immunogenic composition may comprise both a polynucleotide and a polypeptide component. Such immunogenic compositions may provide for an enhanced immune response.

It will be apparent that an immunogenic composition may contain pharmaceutically acceptable salts of the polynucleotides and polypeptides provided herein. Such salts may be prepared from pharmaceutically acceptable non-toxic bases, including organic bases (*e.g.*, salts of primary, secondary and tertiary amines and basic amino acids) and inorganic bases (*e.g.*, sodium, potassium, lithium, ammonium, calcium and magnesium salts).

While any suitable carrier known to those of ordinary skill in the art may be employed in the immunogenic compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (*e.g.*, polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268; 5,075,109; 5,928,647; 5,811,128; 5,820,883; 5,853,763; 5,814,344 and 5,942,252. One may also employ a carrier comprising the particulate-protein complexes described in U.S. Patent No. 5,928,647, which are capable of inducing a class I-restricted cytotoxic T lymphocyte responses in a host.

Such compositions may also comprise buffers (*e.g.*, neutral buffered saline or phosphate buffered saline), carbohydrates (*e.g.*, glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants,

bacteriostats, chelating agents such as EDTA or glutathione, adjuvants (*e.g.*, aluminum hydroxide), solutes that render the formulation isotonic, hypotonic or weakly hypertonic with the blood of a recipient, suspending agents, thickening agents and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the immunogenic compositions of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); AS-2 (SmithKline Beecham, Philadelphia, PA); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the immunogenic compositions provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of an immunogenic composition as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Corixa Corporation (Seattle, WA; *see* US Patent
5 Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555, WO 99/33488 and U.S. Patent Nos. 6,008,200 and 5,856,462. Immunostimulatory DNA sequences are also described, for example, by
10 Sato *et al.*, *Science* 273:352, 1996. Another preferred adjuvant is a saponin, preferably QS21 (Aquila Biopharmaceuticals Inc., Framingham, MA), which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic
15 composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprise an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210.

Other preferred adjuvants include Montanide ISA 720 (Seppic, France),
20 SAF (Chiron, California, United States), ISCOMS (CSL), MF-59 (Chiron), the SBAS series of adjuvants (*e.g.*, SBAS-2 or SBAS-4, available from SmithKline Beecham, Rixensart, Belgium), Detox (Corixa, Hamilton, MT), RC-529 (Corixa, Hamilton, MT) and other aminoalkyl glucosaminide 4-phosphates (AGPs), such as those described in pending U.S. Patent Application Serial Nos. 08/853,826 and 09/074,720, the disclosures
25 of which are incorporated herein by reference in their entireties.

Any immunogenic composition provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient. The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a
30 capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be

prepared using well known technology (*see, e.g., Coombes et al., Vaccine 14:1429-1438, 1996*) and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane.

Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. Such carriers include microparticles of poly(lactide-co-glycolide), polyacrylate, latex, starch, cellulose, dextran and the like. Other delayed-release carriers include supramolecular biovectors, which comprise a non-liquid hydrophilic core (*e.g., a cross-linked polysaccharide or oligosaccharide*) and, optionally, an external layer comprising an amphiphilic compound, such as a phospholipid (*see e.g., U.S. Patent No. 5,151,254 and PCT applications WO 94/20078, WO/94/23701 and WO 96/06638*). The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and immunogenic compositions to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e., matched HLA haplotype*). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature 392:245-251, 1998*) and have been shown to

be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine, or immunogenic composition (*see* Zitvogel *et al.*, *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc γ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a lung tumor protein (or portion or other variant thereof) such that the lung tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition comprising such transfected
5 cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun
10 approach described by Mahvi *et al.*, *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the lung tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide
15 may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

Immunogenic compositions and pharmaceutical compositions may be presented in unit-dose or multi-dose containers, such as sealed ampoules or vials. Such
20 containers are preferably hermetically sealed to preserve sterility of the formulation until use. In general, formulations may be stored as suspensions, solutions or emulsions in oily or aqueous vehicles. Alternatively, an immunogenic or pharmaceutical composition may be stored in a freeze-dried condition requiring only the addition of a sterile liquid carrier immediately prior to use.

25 **CANCER THERAPY**

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as lung cancer. Within such methods, compositions are typically administered to a patient. As used herein, a
“patient” refers to any warm-blooded animal, preferably a human. A patient may or
30 may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions

and immunogenic compositions may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and immunogenic compositions may be administered
5 either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs. Administration may be by any suitable method, including administration by intravenous, intraperitoneal, intramuscular, subcutaneous, intranasal, intradermal, anal, vaginal, topical and oral routes.

10 Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides as provided herein).

15 Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T
20 lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody
25 receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for
30 adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with

retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand
5 antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast and/or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a
10 polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented
15 with IL-2 (*see, for example, Cheever et al., Immunological Reviews 157:177, 1997*).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by
20 intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions described herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and immunogenic compositions may be administered by injection (*e.g.,*
25 intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.,* by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that,
30 when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.,* untreated) level. Such response

can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines, or immunogenic compositions, should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for compositions comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 µg to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

10 In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a lung tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

CANCER DETECTION AND DIAGNOSIS

20 In general, a cancer may be detected in a patient based on the presence of one or more lung tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, sputum urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as lung cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a lung tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

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There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.,* Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by

- 5 (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the
10 remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G,
15 protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding
20 agent. Suitable polypeptides for use within such assays include full length lung tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane.
25 Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply
30 described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption,

and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, 5 in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 µg, and preferably about 100 ng to about 1 µg, is sufficient to immobilize an 10 adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports 15 having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.,* Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. 20 This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to 25 a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically 30 blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The

immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with lung cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as lung cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In

one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett *et al.*, *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized

on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding
5 fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 µg, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use
10 with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use lung tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such lung tumor protein specific antibodies may
15 correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a lung tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a lung tumor polypeptide, a polynucleotide encoding
20 such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T
25 cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with polypeptide (e.g., 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of lung tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of
30 proliferation that is at least two fold greater and/or a level of cytolytic activity that is at

least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a lung tumor protein in a biological sample. For example,
5 at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a lung tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the lung tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as
10 gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a lung tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%,
15 preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a lung tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes hybridize to a polynucleotide encoding a polypeptide described herein under moderately stringent conditions, as defined above. Oligonucleotide primers
20 and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57,
25 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804,
30 807, 808 or 810-826. Techniques for both PCR based assays and hybridization assays

are well known in the art (*see, for example, Mullis et al., Cold Spring Harbor Symp. Quant. Biol., 51:263, 1987; Erlich ed., PCR Technology, Stockton Press, NY, 1989*).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the compositions described herein may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide(s) evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple lung tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor

protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

- 5 The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a lung
- 10 tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.
- 15 Alternatively, a kit may be designed to detect the level of mRNA encoding a lung tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a lung tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be
- 20 present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a lung tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLE 1IDENTIFICATION AND CHARACTERIZATION OF LUNG
TUMOR PROTEIN cDNAS

5 This Example illustrates the identification of cDNA molecules encoding lung tumor proteins.

A. Isolation of cDNA Sequences from Lung Adenocarcinoma Libraries
using Conventional cDNA Library Subtraction

 A human lung adenocarcinoma cDNA expression library was
10 constructed from poly A⁺ RNA from patient tissues (# 40031486) using a Superscript
Plasmid System for cDNA Synthesis and Plasmid Cloning kit (BRL Life Technologies,
Gaithersburg, MD) following the manufacturer's protocol. Specifically, lung carcinoma
tissues were homogenized with polytron (Kinematica, Switzerland) and total RNA was
extracted using Trizol reagent (BRL Life Technologies) as directed by the
15 manufacturer. The poly A⁺ RNA was then purified using an oligo dT cellulose column
as described in Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold
Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989. First-strand cDNA was
synthesized using the NotI/Oligo-dT18 primer. Double-stranded cDNA was
synthesized, ligated with BstXI/EcoRI adaptors (Invitrogen, San Diego, CA) and
20 digested with NotI. Following size fractionation with cDNA size fractionation columns
(BRL Life Technologies), the cDNA was ligated into the BstXI/NotI site of pcDNA3.1
(Invitrogen) and transformed into ElectroMax *E. coli* DH10B cells (BRL Life
Technologies) by electroporation. A total of 3 x 10⁶ independent colonies were
generated.

25 Using the same procedure, a normal human cDNA expression library
was prepared from a panel of normal tissue specimens, including lung, liver, pancreas,
skin, kidney, brain and resting PBMC.

 cDNA library subtraction was performed using the above lung
adenocarcinoma and normal tissue cDNA libraries, as described by Hara *et al.* (*Blood*,
30 84:189-199, 1994) with some modifications. Specifically, a lung adenocarcinoma-

specific subtracted cDNA library was generated as follows. The normal tissue cDNA library (80 µg) was digested with BamHI and XhoI, followed by a filling-in reaction with DNA polymerase Klenow fragment. After phenol-chloroform extraction and ethanol precipitation, the DNA was dissolved in 133 µl of H₂O, heat-denatured and mixed with 133 µl (133 µg) of Photoprobe biotin (Vector Laboratories, Burlingame, CA). As recommended by the manufacturer, the resulting mixture was irradiated with a 270 W sunlamp on ice for 20 minutes. Additional Photoprobe biotin (67 µl) was added and the biotinylation reaction was repeated. After extraction with butanol five times, the DNA was ethanol-precipitated and dissolved in 23 µl H₂O. The resulting DNA, plus other highly redundant cDNA clones that were frequently recovered in previous lung subtractions formed the driver DNA.

To form the tracer DNA, 10 µg lung adenocarcinoma cDNA library was digested with NotI and SpeI, phenol chloroform extracted and passed through Chroma spin-400 columns (Clontech, Palo Alto, CA). Typically, 5 µg of cDNA was recovered after the sizing column. Following ethanol precipitation, the tracer DNA was dissolved in 5 µl H₂O. Tracer DNA was mixed with 15 µl driver DNA and 20 µl of 2 x hybridization buffer (1.5 M NaCl/10 mM EDTA/50 mM HEPES pH 7.5/0.2% sodium dodecyl sulfate), overlaid with mineral oil, and heat-denatured completely. The sample was immediately transferred into a 68 °C water bath and incubated for 20 hours (long hybridization [LH]). The reaction mixture was then subjected to a streptavidin treatment followed by phenol/chloroform extraction. This process was repeated three more times. Subtracted DNA was precipitated, dissolved in 12 µl H₂O, mixed with 8 µl driver DNA and 20 µl of 2 x hybridization buffer, and subjected to a hybridization at 68 °C for 2 hours (short hybridization [SH]). After removal of biotinylated double-stranded DNA, subtracted cDNA was ligated into NotI/SpeI site of chloramphenicol resistant pBCSK⁺ (Stratagene, La Jolla, CA) and transformed into ElectroMax *E. coli* DH10B cells by electroporation to generate a lung adenocarcinoma specific subtracted cDNA library, referred to as LAT-S1. Similarly, LAT-S2 was generated by including 23 genes that were over-expressed in the tracer as additional drivers.

A second human lung adenocarcinoma cDNA expression library was constructed using adenocarcinoma tissue from a second patient (# 86-66) and used to

prepare a second lung adenocarcinoma-specific subtracted cDNA library (referred to as LAT2-S2), as described above, using the same panel of normal tissues and the additional genes over-expressed in LAT-S1.

A third human metastatic lung adenocarcinoma library was constructed from a pool of two lung pleural effusions with lung and gastric adenocarcinoma origins. The subtracted cDNA library, Mets-sub2 was generated as described above using the same panel of normal tissues. However, the Mets-sub3 subtracted library was constructed by including 51 additional genes as drivers. These 51 genes were recovered in Mets-sub2, representing over-expressed housekeeping genes in the testers. As a result, Mets-sub3 is more complexed and normalized.

A total of 16 cDNA fragments isolated from LAT-S1, 585 cDNA fragments isolated from LAT-S2, 568 cDNA clones from LAT2-S2, 15 cDNA clones from Mets-sub2 and 343 cDNA clones from Mets-sub3, described above, were colony PCR amplified and their mRNA expression levels in lung tumor, normal lung, and various other normal and tumor tissues were determined using microarray technology (Incyte, Palo Alto, CA). Briefly, the PCR amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. This intensity correlates with the hybridization intensity. Seventy-three non-redundant cDNA clones, of which 42 were found to be unique, showed over-expression in lung tumors, with expression in normal tissues tested (lung, skin, lymph node, colon, liver, pancreas, breast, heart, bone marrow, large intestine, kidney, stomach, brain, small intestine, bladder and salivary gland) being either undetectable, or at significantly lower levels compared to lung adenocarcinoma tumors. These clones were further characterized by DNA sequencing with a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A and/or Model 377 (Foster City, CA).

The sequences were compared to known sequences in the gene bank using the EMBL GenBank databases (release 96). No significant homologies were found to the sequence provided in SEQ ID NO: 67, with no apparent homology to

previously identified expressed sequence tags (ESTs). The sequences of SEQ ID NO: 60, 62, 65, 66, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97 and 98 were found to show some homology to previously identified expressed sequence tags (ESTs). The cDNA sequences of SEQ ID NO: 59, 61, 63, 64, 67, 68, 72, 73, 75, 77, 78, 81-83, 85, 87, 88, 93, 94, 96, 99 and 100 showed homology to previously identified genes. The full-length cDNA sequences for the clones of SEQ ID NO: 96 and 100 are provided in SEQ ID NO: 316 and 318, respectively. The amino acid sequences for the clones of SEQ ID NO: 59, 61, 63, 64, 68, 73, 82, 83, 94, 96 and 100 are provided in SEQ ID NO: 331, 328, 329, 332, 327, 333, 330, 326, 325, 324 and 335, respectively. A predicted amino acid sequence encoded by the sequence of SEQ ID NO: 69 (referred to as L552S) is provided in SEQ ID NO: 786.

Further studies led to the isolation of an extended cDNA sequence, and open reading frame, for L552S (SEQ ID NO: 790). The predicted amino acid sequence encoded by the cDNA sequence of SEQ ID NO: 790 is provided in SEQ ID NO: 791. The determined cDNA sequence of an isoform of L552S is provided in SEQ ID NO: 792, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 793. Subsequent studies led to the isolation of the full-length cDNA sequence of L552S (SEQ ID NO: 808). The corresponding amino acid sequence is provided in SEQ ID NO: 809. No homologies were found to the protein sequence of L552S. However, nucleotides 533-769 of the full-length cDNA sequence were found to show homology to a previously identified DNA sequence.

Full-length cloning efforts on L552S led to the isolation of three additional cDNA sequences (SEQ ID NO: 810-812) from a metastatic lung adenocarcinoma library. The sequence of SEQ ID NO: 810 was found to show some homology to previously identified human DNA sequences. The sequence of SEQ ID NO: 811 was found to show some homology to a previously identified DNA sequence. The sequence of SEQ ID NO: 812 was found to show some homology to previously identified ESTs.

The gene of SEQ ID NO: 84 (referred to as L551S) was determined by real-time RT-PCR analysis to be over-expressed in 2/9 primary adenocarcinomas and to be expressed at lower levels in 2/2 metastatic adenocarcinomas and 1/2 squamous cell

carcinomas. No expression was observed in normal tissues, with the exception of very low expression in normal stomach. Further studies on L551S led to the isolation of the 5' and 3' cDNA consensus sequences provided in SEQ ID NO: 801 and 802, respectively. The L551S 5' sequence was found to show some homology to the previously identified gene STY8 (cDNA sequence provided in SEQ ID NO: 803; corresponding amino acid sequence provided in SEQ ID NO: 805), which is a mitogen activated protein kinase phosphatase. However, no significant homologies were found to the 3' sequence of L551S. Subsequently, an extended cDNA sequence for L551S was isolated (SEQ ID NO: 804). The corresponding amino acid sequence is provided in SEQ ID NO: 806. Further studies led to the isolation of two independent full-length clones for L551S (referred to as 54298 and 54305). These two clones have five nucleotide differences compared to the STY8 DNA sequence. Two of these differences are single nucleotide polymorphisms which do not effect the encoded amino acid sequences. The other three nucleotide differences are consistent between the two L551S clones but lead to encoded amino acid sequences that are different from the STY8 protein sequence. The determined cDNA sequences for the L551S full-length clones 54305 and 54298 are provided in SEQ ID NO: 825 and 826, respectively, with the amino acid sequence for L551S being provided in SEQ ID NO: 827.

B. Isolation of cDNA Sequences from Lung Adenocarcinoma Libraries using PCR-Based cDNA Library Subtraction

cDNA clones from a PCR-based subtraction library, containing cDNA from a pool of two human lung primary adenocarcinomas subtracted against a pool of nine normal human tissue cDNAs including skin, colon, lung, esophagus, brain, kidney, spleen, pancreas and liver, (Clontech, Palo Alto, CA) were derived and submitted to a first round of PCR amplification. This library (referred to as ALT-1) was subjected to a second round of PCR amplification, following the manufacturer's protocol. The expression levels of 760 cDNA clones in lung tumor, normal lung, and various other normal and tumor tissues, were examined using microarray technology as described above. A total of 118 clones, of which 55 were unique, were found to be over-expressed in lung tumor tissue, with expression in normal tissues tested (lung, skin,

lymph node, colon, liver, pancreas, breast, heart, bone marrow, large intestine, kidney, stomach, brain, small intestine, bladder and salivary gland) being either undetectable, or at significantly lower levels. The sequences were compared to known sequences in the gene bank using the EMBL and GenBank databases (release 96). No significant
5 homologies (including ESTs) were found to the sequence provided in SEQ ID NO: 44. The sequences of SEQ ID NO: 1, 11, 13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43, 45, 46, 51 and 57 were found to show some homology to previously identified expressed sequence tags (ESTs). The cDNA sequences of SEQ ID NO: 2-10, 12, 14, 16-19, 21, 22, 28, 31, 32, 35-38, 40, 42, 44, 47-50, 52-56 and 58 showed homology to previously
10 identified genes. The full-length cDNA sequences for the clones of SEQ ID NO: 18, 22, 31, 35, 36 and 42 are provided in SEQ ID NO: 320, 319, 323, 321, 317, 321 and 322, respectively, with the corresponding amino acid sequences being provided in SEQ ID NO: 337, 336, 340, 338, 334, and 339, respectively.

Further studies led to the isolation of an extended cDNA sequence for
15 the clone of SEQ ID NO: 33 (referred to as L801P). This extended cDNA sequence (provided in SEQ ID NO: 796), was found to contain three potential open reading frames (ORFs). The predicted amino acid sequences encoded by these three ORFs are provided in SEQ ID NO: 797-799, respectively.

In subsequent studies, a full-length cDNA sequence for the clone of SEQ
20 ID NO: 44 (referred to as L844P) was isolated (provided in SEQ ID NO: 800). Comparison of this sequence with those in the public databases revealed that the 470 bases at the 5' end of the sequence show homology to the known gene dihydrodiol dehydrogenase, thus indicating that L844P is a novel transcript of the dihydrodiol dehydrogenase family having 2007 base pairs of previously unidentified 3'
25 untranslated region.

The predicted amino acid sequence encoded by the sequence of SEQ ID
NO: 46 (referred to as L840P) is provided in SEQ ID NO: 787. An extended cDNA sequence for L840P, which was determined to include an open reading frame, is provided in SEQ ID NO: 794. The predicted amino acid sequence encoded by the
30 cDNA sequence of SEQ ID NO: 794 is provided in SEQ ID NO: 795. The full-length cDNA sequence for the clone of SEQ ID NO: 54 (referred to as L548S) is provided in

SEQ ID NO: 788, with the corresponding amino acid sequence being provided in SEQ ID NO: 789.

Northern blot analyses of the genes of SEQ ID NO: 25 and 46 (referred to as L839P and L840P, respectively) were remarkably similar. Both genes were
5 expressed in 1/2 lung adenocarcinomas as two bands of 3.6 kb and 1.6 kb. No expression of L839P was observed in normal lung or trachea. No expression of L840P was observed in normal bone marrow, resting or activated PBMC, esophagus, or normal lung. Given the similar expression patterns, L839P and L840P may be derived from the same gene.

10 Further studies on L773P (SEQ ID NO: 58) resulted in the isolation of the extended consensus cDNA sequence provided in SEQ ID NO: 807.

Additional lung adenocarcinoma cDNA clones were isolated as follows. A cDNA library was prepared from a pool of two lung adenocarcinomas and subtracted against cDNA from a panel of normal tissues including lung, brain, liver, kidney,
15 pancreas, skin, heart and spleen. The subtraction was performed using a PCR-based protocol (Clontech), which was modified to generate larger fragments. Within this protocol, tester and driver double stranded cDNA were separately digested with five restriction enzymes that recognize six-nucleotide restriction sites (MluI, MscI, PvuII, Sall and StuI). This digestion resulted in an average cDNA size of 600 bp, rather than
20 the average size of 300 bp that results from digestion with RsaI according to the Clontech protocol. The ends of the restriction digested tester cDNA were filled in to generate blunt ends for adapter ligation. This modification did not affect the subtraction efficiency. Two tester populations were then created with different adapters, and the driver library remained without adapters. The tester and driver libraries were then
25 hybridized using excess driver cDNA. In the first hybridization step, driver was separately hybridized with each of the two tester cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs and (d) unhybridized driver cDNAs. The two separate hybridization reactions were then combined, and
30 rehybridized in the presence of additional denatured driver cDNA. Following this second hybridization, in addition to populations (a) through (d), a fifth population (e)

was generated in which tester cDNA with one adapter hybridized to tester cDNA with the second adapter. Accordingly, the second hybridization step resulted in enrichment of differentially expressed sequences which could be used as templates for PCR amplification with adaptor-specific primers.

5 The ends were then filled in, and PCR amplification was performed using adaptor-specific primers. Only population (e), which contained tester cDNA that did not hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

10 Fifty-seven cDNA clones were isolated from the subtracted library (referred to as LAP1) and sequenced. The determined cDNA sequences for 16 of these clones are provided in SEQ ID NO: 101-116. The sequences of SEQ ID NO: 101 and 114 showed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 102-109 and 112 showed some similarity to previously
15 identified sequences, while the sequences of SEQ ID NO: 113, 115 and 116 showed some similarity to previously isolated ESTs.

C. Isolation of cDNA Sequences from Small Cell Lung Carcinoma

Libraries using PCR-Based cDNA Library Subtraction

A subtracted cDNA library for small cell lung carcinoma (referred to as
20 SCL1) was prepared using essentially the modified PCR-based subtraction process described above. cDNA from small cell lung carcinoma was subtracted against cDNA from a panel of normal tissues, including normal lung, brain, kidney, liver, pancreas, skin, heart, lymph node and spleen. Both tester and driver poly A+ RNA were initially amplified using SMART PCR cDNA synthesis kit (Clontech, Palo Alto, CA). The
25 tester and driver double stranded cDNA were separately digested with five restriction enzymes (DraI, MscI, PvuII, SmaI, and StuI). These restriction enzymes generated blunt end cuts and the digestion resulted in an average insert size of 600 bp. Digestion with this set of restriction enzymes eliminates the step required to generate blunt ends by filling in of the cDNA ends. These modifications did not affect subtraction
30 efficiency.

Eighty-five clones were isolated and sequenced. The determined cDNA sequences for 31 of these clones are provided in SEQ ID NO: 117-147. The sequences of SEQ ID NO: 122, 124, 126, 127, 130, 131, 133, 136, 139 and 147 showed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 120, 129, 135, 137, 140, 142, 144 and 145 showed some similarity to previously identified gene sequences, while the sequences of SEQ ID NO: 114, 118, 119, 121, 123, 125, 128, 132, 134, 138, 141, 143 and 147 showed some similarity to previously isolated ESTs.

In further studies, three additional cDNA libraries were generated from poly A+ RNA from a single small cell lung carcinoma sample subtracted against a pool of poly A+ RNA from nine normal tissues (lung, brain, kidney, liver, pancreas, skin, heart pituitary gland and spleen). For the first library (referred to as SCL2), the subtraction was carried out essentially as described above for the LAP1 library, with the exception that the tester and driver were digested with PvuII, StuI, MscI and DraI. The ratio of tester and driver cDNA used was as recommended by Clontech. For the second library (referred to as SCL3), subtraction was performed essentially as for SCL2 except that cDNA for highly redundant clones identified from the SCL2 library was included in the driver cDNA. Construction of the SCL4 library was performed essentially as described for the SCL3 library except that a higher ratio of driver to tester was employed.

Each library was characterized by DNA sequencing and database analyses. The determined cDNA sequence for 35 clones isolated from the SCL2 library are provided in SEQ ID NO: 245-279, with the determined cDNA sequences for 21 clones isolated from the SCL3 library and for 15 clones isolated from the SCL4 library being provided in SEQ ID NO: 280-300 and 301-315, respectively. The sequences of SEQ ID NO: 246, 254, 261, 262, 304, 309 and 311 showed no significant homologies to previously identified sequences. The sequence of SEQ ID NO: 245, 248, 255, 266, 270, 275, 280, 282, 283, 288-290, 292, 295, 301 and 303 showed some homology to previously isolated ESTs, while the sequences of SEQ ID NO: 247, 249-253, 256-260, 263-265, 267-269, 271-274, 276-279, 281, 284-287, 291, 293, 294, 296-300, 302, 305-308, 310 and 312-315 showed some homology to previously identified gene sequences.

D. Isolation of cDNA Sequences from a Neuroendocrine Library using
PCR-Based cDNA Library Subtraction

Using the modified PCR-based subtraction process, essentially as described above for the LAP1 subtracted library, a subtracted cDNA library (referred to as MLN1) was derived from a lung neuroendocrine carcinoma that had metastasized to the subcarinal lymph node, by subtraction with a panel of nine normal tissues, including normal lung, brain, kidney, liver, pancreas, skin, heart, lymph node and spleen.

Ninety-one individual clones were isolated and sequenced. The determined cDNA sequences for 58 of these clones are provided in SEQ ID NO: 147-222. The sequences of SEQ ID NO: 150, 151, 154, 157, 158, 159, 160, 163, 174, 175, 178, 186-190, 192, 193, 195-200, 208-210, 212-215 and 220 showed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 152, 155, 156, 161, 165, 166, 176, 179, 182, 184, 185, 191, 194, 221 and 222 showed some similarity to previously identified gene sequences, while the sequences of SEQ ID NO: 148, 149, 153, 164, 167-173, 177, 180, 181, 183, 201-207, 211 and 216-219 showed some similarity to previously isolated ESTs.

The determined cDNA sequences of an additional 442 clones isolated from the MLN1 library are provided in SEQ ID NO: 341-782.

E. Isolation of cDNA Sequences from a Squamous Cell Lung Carcinoma
Library using PCR-Based cDNA Library Subtraction

A subtracted cDNA library for squamous cell lung carcinoma (referred to as SQL1) was prepared, essentially using the modified PCR-based subtraction process described above, except the tester and driver double stranded cDNA were separately digested with four restriction enzymes (DraI, MscI, PvuII and StuI) cDNA from a pool of two squamous cell lung carcinomas was subtracted against cDNA from a pool of 10 normal tissues, including normal lung, brain, kidney, liver, pancreas, skin, heart, spleen, esophagus and trachea.

Seventy-four clones were isolated and sequenced. The determined cDNA sequences for 22 of these clones are provided in SEQ ID NO: 223-244. The sequence of SEQ ID NO: 241 showed no significant homologies to previously

identified sequences. The sequences of SEQ ID NO: 223, 225, 232, 233, 235, 238, 239, 242 and 243 showed some similarity to previously identified gene sequences, while the sequences of SEQ ID NO: 224, 226-231, 234, 236, 237, 240, 241 and 244 showed some similarity to previously isolated ESTs.

5 The sequences of an additional 12 clones isolated during chracterization of cDNA libraries prepared from lung tumor tissue are provided in SEQ ID NO: 813-824. Comparison of these sequences with those in the GenBank database and the GeneSeq DNA database revealed no significant homologies to previously identified sequences.

10

EXAMPLE 2

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems
15 Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following
20 cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water
25 (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

EXAMPLE 3

PREPARATION OF ANTIBODIES AGAINST LUNG CANCER ANTIGENS

Polyclonal antibodies against the lung cancer antigen L773P (SEQ ID
5 NO: 783) were prepared as follows.

Rabbits were immunized with recombinant protein expressed in and
purified from *E. coli* as described above. For the initial immunization, 400 µg of
antigen combined with muramyl dipeptide (MDP) was injected subcutaneously (S.C.).
Animals were boosted S.C. 4 weeks later with 200 µg of antigen mixed with incomplete
10 Freund's Adjuvant (IFA). Subsequent boosts of 100 µg of antigen mixed with IFA
were injected S.C. as necessary to induce high antibody titer responses. Serum bleeds
from immunized rabbits were tested for L773P-specific reactivity using ELISA assays
with purified protein and showed strong reactivity to L773P. Polyclonal antibodies
against L773P were affinity purified from high titer polyclonal sera using purified
15 protein attached to a solid support.

EXAMPLE 4

PROTEIN EXPRESSION OF LUNG TUMOR-SPECIFIC ANTIGENS

20 Full-length L773P (amino acids 2-364 of SEQ ID NO: 783), with a 6X
His Tag, were subcloned into the pPDM expression vector and transformed into either
BL21 CodonPlus or BL21 pLysS host cells using standard techniques. High levels of
expression were observed in both cases. Similarly, the N-terminal portion of L773P
(amino acids 2-71 of SEQ ID NO: 783; referred to as L773PA), with a 6X His tag were
25 subcloned into the vector pPDM and transformed into BL21 CodonPlus host cells. Low
levels of expression were observed by N-terminal sequencing. The sequence of the
expressed constructs for L773P and L773PA are provided in SEQ ID NO: 784 and 785,
respectively.

30

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

What is claimed:

1. An isolated polypeptide, comprising at least an immunogenic portion of a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 under moderately stringent conditions; and

(c) complements of sequences of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-

782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NOs: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827.

4. An isolated polynucleotide encoding at least 15 amino acid residues of a lung tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826, or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide, comprising a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826.

7. An isolated polynucleotide, comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 under moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector, comprising a polynucleotide according to any one of claims 4-8.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a lung tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30,

33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 or a complement of any of the foregoing polynucleotide sequences.

12. A fusion protein, comprising at least one polypeptide according to claim 1.

13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

15. A fusion protein according to claim 12, wherein the fusion protein comprises an affinity tag.

16. An isolated polynucleotide encoding a fusion protein according to claim 12.

17. A pharmaceutical composition, comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:

- (a) a polypeptide according to claim 1;
- (b) a polynucleotide according to claim 4;
- (c) an antibody according to claim 11;
- (d) a fusion protein according to claim 12; and
- (e) a polynucleotide according to claim 16.

18. An immunogenic composition comprising an immunostimulant and at least one component selected from the group consisting of:

- (a) a polypeptide according to claim 1;
- (b) a polynucleotide according to claim 4;
- (c) an antibody according to claim 11;
- (d) a fusion protein according to claim 12; and
- (e) a polynucleotide according to claim 16.

19. An immunogenic composition according to claim 18, wherein the immunostimulant is an adjuvant.

20. An immunogenic composition according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an immunogenic composition according to claim 18.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. An immunogenic composition comprising an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(c) complements of sequences of (i) or (ii);
in combination with an immunostimulant.

26. An immunogenic composition according to claim 25, wherein the immunostimulant is an adjuvant.

27. An immunogenic composition according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. An immunogenic composition according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(c) complements of sequences of (i) or (ii) encoded by a polynucleotide recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

and thereby inhibiting the development of a cancer in the patient.

30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is lung cancer.

32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

33. A method according to claim 32, wherein the biological sample is blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 32.

35. A method for stimulating and/or expanding T cells specific for a lung tumor protein, comprising contacting T cells with at least one component selected from the group consisting of:

(a) polypeptides comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(ii) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(iii) complements of sequences of (i) or (ii);

(b) polynucleotides encoding a polypeptide of (a); and

(c) antigen presenting cells that express a polypeptide of (a);

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared according to the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

38. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

(i) polypeptides comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(1) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(2) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(3) complements of sequences of (1) or (2);

(ii) polynucleotides encoding a polypeptide of (i); and

(iii) antigen presenting cells that expresses a polypeptide of (i);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

(i) polypeptides comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(1) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(2) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(3) complements of sequences of (1) or (2);

(ii) polynucleotides encoding a polypeptide of (i); and

(iii) antigen presenting cells that express a polypeptide of (i);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

40. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

41. A method according to claim 40, wherein the binding agent is an antibody.

42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

43. A method according to claim 40, wherein the cancer is lung cancer.

44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any

one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

45. A method according to claim 44, wherein the binding agent is an antibody.

46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

47. A method according to claim 44, wherein the cancer is a lung cancer.

48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-

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(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

49. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

50. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

51. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

- (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;
- (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
- (d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 11; and
- (b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a lung tumor

protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826, or a complement of any of the foregoing polynucleotides.

59. A oligonucleotide according to claim 58, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-82.

60. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 59; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

SEQUENCE LISTING

<110> Corixa Corporation
 Wang, Tongtong
 Bangur, Chaitanya S.
 Lodes, Michael A.
 Fanger, Gary
 Vedvick, Tom
 Carter, Darrick
 Retter, Marc
 Mannion, Jane

<120> COMPOSITIONS AND METHODS FOR THERAPY AND
 DIAGNOSIS OF LUNG CANCER

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atggagggag	gattttatgg	agaaatgggg	atagtcttca	tgaccacaaa	taaataaagg	180
aaaactaagc	tgcatgtgtg	gttttgaaaa	ggttattata	cttcttaaca	attctttttt	240
tcagggactt	ttctagctgt	atgactgtta	cttgaccttc	tttgaaaagc	attcccaaaa	300
tgctctatct	tagatagatt	aacattaacc	aacataatct	tttttagatc	gagtcagcat	360
aaatttctaa	gtcagcctct	agtcgtgggt	catctctttc	acctgcattt	tatttgggtg	420
ttgtctgaag	aaaggaaaga	ggaaagcaaa	tacgaattgt	actatttgta	ccaaatcttt	480
gggattcatt	ggcaaataat	ttcagtgtgg	tgtattatta	aataagaaaa	aaaaattttg	540
tttcctaggt	tgaagggtcta	attgatacgt	ttgacttatg	atgaccattt	atgcactttc	600
aaatgaattt	gctttcaaaa	taaatgaaga	gcag			634

<210> 24

<211> 512

<212> DNA

<213> Homo sapien

<400> 24

gcaaaacaag	cctaagcaag	cacaacgaag	agcagaagtc	agtgaatta	aaaagaggaa	60
aaagaaaaat	cataaaaaatc	ataaaaagtt	atttctttga	aaagatcaat	gaaatttagc	120
aagactgaca	cagataaaaa	ggaattagac	ccaaatcagt	gaacaggaat	gaaatagagg	180
atatcactac	agaggctgca	gccattgaaa	ggataattag	gaaatccac	agataacttt	240
gtgctcataa	atttgacaat	gtagaggaaa	tatctttagt	tttaattagc	tttttatctt	300
agtttttctc	aaaaactaaa	acttaataaa	actcaaccaa	gacaaaatag	acaatcagaa	360
tgtaggcata	cctcagagat	gtggcggatt	tggtttcaga	ctactgcaat	aaaccaaata	420
tggcaataaa	aggagtcaca	gaaagtgggt	tcccagtgtg	tatatataaa	agttacattt	480
actctatgaa	gtgcaataac	attttgtcta	aa			512

<210> 25

<211> 461

<212> DNA

<213> Homo sapien

<400> 25

ctctgtttca	gcacctcatt	gggattattg	aactcattaa	attcttttaca	tgaacttgaa	60
ttgttcattg	aaatctctag	ccatttccct	ggttaaacag	gataatcttt	ttttttcact	120
aaagaacatt	cgtgggtggt	tagtgatgag	gttaatatct	ccctcttgtc	cacctccaca	180
ttggaaaaac	cacgttggac	tgagttttga	ggagcaaaga	actaatcact	tgaccaaagg	240
ggccctgtat	ccccacaagc	cctgggtatt	tttctctcat	agagagaaga	gggtctgtat	300
ggatacctga	aaatgtgatt	ttatatattc	ttggcatcca	ggggagaaaa	atcaaaaagc	360
aaggaagtta	cagttatctc	cccagaaatt	aatgggtcat	gtcaagacta	taggttttca	420

tttccttctg ttgcttggtta gaatgatgtt cttgtgggaa a 461

<210> 26
 <211> 317
 <212> DNA
 <213> Homo sapien

<400> 26
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 taggatttat tacactaaaa aaaaattagt ttttgaaaag aaataggaga atacagaaac 120
 atgaatttca cgaggctatc atctaacagt gggggccttc tacacacgtg gtgccaaaat 180
 gtgtcattct gagtcaattg caattcctct ctaggagtga aaagagataa aagataagcc 240
 aagaaccctg gacagattct tgggtgttggg gacaaagagg aaaggacctg agaatggggc 300
 tgggtggggag agggggg 317

<210> 27
 <211> 250
 <212> DNA
 <213> Homo sapien

<400> 27
 taattgctgt gattattaga attctatcat gactgtattg tagtttttgc tctatttcag 60
 ataagcmaga tctaagaagt tatcaaaact attctttaaa atgctaaagc aggttaacttt 120
 ttcttccatt attttttcct cctaccactg agttttgtaa tgaattcctt gtgtatacaa 180
 gcaatacagg tgaataactaa actgttattt ttagcttctt caaaagctat tttagaaagc 240
 ttcttgaaaa 250

<210> 28
 <211> 532
 <212> DNA
 <213> Homo sapien

<400> 28
 cctatatcat tcatattatac agaagctgct tgctgcttag caagttgggtg ggtttgattt 60
 tccttggttg ctttgcagac ctcccttgag aggattcctt ctggatggag atttctttgt 120
 tgctgtctcc cttgccacaa ctctgaccaa gattgcattg cgctatgtag ctttggttca 180
 ggagaagaaa aagcaaaatt cttttgttgc tgaggctatg ttgctcatgg ctactatcct 240
 gcatttgagg aaatcctctc ttcttaagaa gccattact gatgatgatg tggatcgaat 300
 ttccctgtgc ctcaaggtct tgtctgaatg ttacacctta atgaatgaca ttttcaataa 360
 ggaatgcaga cagtcccttt ctacatgtt atctgctaaa ctagaagaag agaaattatc 420
 ccaaaagaaa gaatctgaaa agaggaatgt gacagtacag cctgatgacc ccatttcctt 480
 catgcaacta actgctaaga atgaaatgaa ctgcaaggaa gatcagtttc ag 532

<210> 29
 <211> 486
 <212> DNA
 <213> Homo sapien

<400> 29
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 ctctctattg tcatgttgct tctttctgca aatatatctt acaagttaga ctttaaactt 120
 ttgatctccc acaccaaaaag agaaaaataat atttatatgg aagtaatttt attttagtgt 180
 ttgtgattta ttgtggagag caggbgttta aaaatttttag aatttctttt taacaaaatc 240
 aaatacattg ttaaggtaac aaagaataat tcactatttc agcatttcaa agcaacatat 300
 tctacaactt caaagatatt tgcaaaaata atacaactgt tgaagttcaa atgttatgga 360

aagaaacatt agaagtatga aaagtgggtac aaaaacatgt ttctttttat tctcttggat	420
atatatctat atatttagga aaatacatat atgtatgtgt atgtatatat atgtatgaaa	480
atatac	486

<210> 30
 <211> 240
 <212> DNA
 <213> Homo sapien

<400> 30	
aagacctgag gaaggaaaac aaattggctt cctgctgaag aakcaaaata gacatttttt	60
aatgtctctt gaccccagtt ccaagttcac cctgttgctt gttcttcttc ccaccttttg	120
gggttctata actgcatccc ccacacatct ttcaccacca cccatacat accagctctc	180
ctgttgtggg attcaggaca taggaagagt tgctgaaggc acgggtgctt ttgggattcg	240

<210> 31
 <211> 233
 <212> DNA
 <213> Homo sapien

<400> 31	
ccattgatgc aggatatcgg cacattgact gtgcctatgt ctatcagaat gaacatgaag	60
tgggggaagc catccaagag aagatccaag agaaggctgt gaagcgggag gacctgttca	120
tcgtcagcaa gttgtggccc actttctttg agagaccctt tgtgaggaaa gcctttgaga	180
agaccctcaa ggacctgaag ctgagctatc tggacgtcta tcttattcac tgg	233

<210> 32
 <211> 233
 <212> DNA
 <213> Homo sapien

<400> 32	
gaggaatgct ggactggagg cccctggagc cagatggcaa gagggtgaca gcttcctttc	60
ctgtgtgtac tctgtccagt tccttttagaa aaaatggatg cccagaggac tcccaaccct	120
ggcttggggg caagaaacag ccagcaagag ttaggggcct tagggcactg ggctgttgtt	180
ccattgaagc cgactctggc cctggccctt acttgcttct ctagctctct agg	233

<210> 33
 <211> 319
 <212> DNA
 <213> Homo sapien

<400> 33	
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ctggaattgc ttggttctcc tccatgtggc ctctccagta ggctagctca ggcttattca	120
catgatggct tcaggattcc aaagagagtg agagtagaag ctgaaagact tcttgagttc	180
ttggcctgga actgggacta ggacagtgtc acttctgcta agttcttttg gtcagagcaa	240
atcacaaggc tttacccaga ttcaagggat gagaaacaga ctacatgtct tgatgagggg	300
aaccacaaag agcttgtgg	319

<210> 34
 <211> 340
 <212> DNA
 <213> Homo sapien

<400> 34

tacagatttta	attcatgtta	ttaactccct	gcctttttacc	tcctccctcc	tcctttggca	60
caactgccag	atggatgtgg	ctggaagtca	gaggacattc	tcgtgggttc	gtgggcctag	120
ggtacaaatg	acctcagcgt	gacagcaaac	aggacagaga	agaccaggct	cttactcagg	180
aatccaccag	ccaggagaa	gacaatgttg	aacaccggaa	ccctgatgat	atctgtcaca	240
tttgtaaggt	tgatttcaga	gtcaggagt	gagacatcgg	cagttgactt	gggtggagct	300
tgggtcacag	ttctggggct	ggtatagagt	gggcacaagg			340

<210> 35

<211> 170

<212> DNA

<213> Homo sapien

<400> 35

acatgggtcc	ttcactcctc	gctgagatgt	tgccggcagcc	ttttcttcca	atgcggttgt	60
ggcaggagaa	tccacggatg	taatgttttc	acctttttcc	ctgagggtgc	tttctgagga	120
accagycctt	aagagggtggg	gtcttggatt	cctgaccag	gcgtccggca		170

<210> 36

<211> 475

<212> DNA

<213> Homo sapien

<400> 36

ctgttttttg	acttaattaa	ccattgcaag	tggaaccacaa	gaaataattg	tagcataact	60
ctctctattg	kcatgtttgct	tctttctgca	aataatattc	agaagttaga	ctttaaacct	120
ttgatctccc	acaccaaag	agaaaataat	atztatatgg	aagtaatttt	attttagtgt	180
ttgtgattta	ttgtggagag	cagggtgtta	aaaatttttag	aatttcttta	acaaaattct	240
aaagagaaaa	taaaaaagaa	atcacagtat	ttacagagat	aacagaatgg	cttagccatg	300
caaaacaaat	aacttttggt	tttcccttt	tacttttggt	taaatgttga	ccaagattca	360
atTTTTTTT	ctgccaaata	aaacttcaat	aaaagtttag	aggcaaaata	acgtattttc	420
TTTTTTTccc	ataatatTTT	atacagcatc	gagtctaaga	atattttatg	cattt	475

<210> 37

<211> 246

<212> DNA

<213> Homo sapien

<400> 37

ccttgagctt	gggccgggca	ctgaggcgcc	ccacatatgc	tgagagcagg	gggaacgcac	60
ccaggcagcc	aggggctagg	acctcatgga	tcagcagcaa	gtccagcagg	ttgtagtcag	120
cgaaggagat	ctggctctcc	acaatgaagg	tcttgccctc	ctggttctgg	gacagcaggg	180
tctcaaaagg	cttcagttgc	ccgggcagtg	ccttcacata	gtcatccttg	cccacctcat	240
agttgg						246

<210> 38

<211> 512

<212> DNA

<213> Homo sapien

<400> 38

gctggaagt	aaatgcagat	cagacccatt	gtgatgtcac	agaaagatgg	ggacaggcca	60
aagaaaaaag	tgactttcaa	ctcttcttcc	atcattttta	tcataccag	tgatgaatca	120
ctgtcagttg	acgacagcga	caaaaccaat	gggtccaaag	ttgatgtaat	ccaagttcgt	180
cctttgtagg	aatgaagaat	ggcaacgaaa	gatggggcct	taaattggat	gccacttttg	240

gactttcatc	ataagaagtg	tctggaatac	ccgttctatg	taatataaac	agaaccttgt	300
gggccagcag	gaaatccgaa	ttgcccatac	gctcttgggc	ctcaggaaga	ggttgaacaa	360
aaacaaattc	ttttaattca	acgggtgctt	tacataatga	aaaaaccact	tgtggcacac	420
gatgggcatc	taacatcatc	atcttctaata	gtgttgaggaga	ttttcatttc	aaatatattt	480
tttaaatatc	tctattttcc	aaaacacgta	at			512

<210> 39

<211> 370

<212> DNA

<213> Homo sapien

<400> 39

ttttatgaac	aagatataag	gatcaaaaaa	aagggtgttg	atatgttttt	ccaagcagag	60
atgtactcga	ctctgtccta	tttagccttc	ccatacctga	cttctaatac	cttttcctgg	120
tgccctycca	tctccctaac	ccccctcac	agggatgcct	cctccaagg	ctccagaaac	180
tctgacctc	gactgctgg	aggagacca	tgaattgctg	gtcaatatcg	ctcatcctct	240
akactccatc	ctgcgtgtgc	ttcttcctac	aagagctaga	gaggcactga	ctgataaata	300
cctgtcacct	gcccccttcc	cagagggtga	aactccaccc	actcccactg	cagaaatgaa	360
tcttaaatgg						370

<210> 40

<211> 204

<212> DNA

<213> Homo sapien

<400> 40

cctgagggtt	ttccctttaa	attttcattg	agttgtccat	ctccagcata	tagggcttca	60
ggagcagagc	agaccttggt	tttagtggtt	ccatgggata	aaatgggatt	ggaggagcta	120
gaagaattca	gggtctggtc	caatctgcca	gtcttcctga	aatatcgaaa	atacaccagg	180
gctgctatat	cagagccacc	ctgg				204

<210> 41

<211> 447

<212> DNA

<213> Homo sapien

<400> 41

caggcagcaa	ttcgtaaaga	attaaatgag	tacaaaagta	atgaaatgga	ggtacatgca	60
tcaagcaagc	acttgacaag	attccacagg	ccatagagat	tttcttctga	gaagaatttg	120
tgtttaattt	tttgatacca	acactgaaca	ttcatcaggg	aactttcctg	aagttcagct	180
caagactacc	ctacctgctg	tgtttgtag	aagagtagga	tcacacacac	aggtgcaatc	240
ttgaccacac	ttacctgcaa	gaggagtaac	cagaggacac	acttccttcc	ttctttggtg	300
tctgaggagt	gtgaactggt	ggggtcagtt	aagacccaac	ataactctat	cagaagaaaa	360
ctgttggttg	cctttcaacc	ttgttttaca	gttctgcagt	gtagtggagg	acgggcaacg	420
tgcattgtgca	ggctcaccac	tcccagg				447

<210> 42

<211> 498

<212> DNA

<213> Homo sapien

<400> 42

ctgggtttgt	aaaaacagtc	tctttattct	actgtgctga	aaccctcacc	aatatagaaa	60
attagattct	cattgcactg	aactatattt	atatgcctaa	gtatgtagaa	gtaaaattat	120
ataccccaaa	aggattttat	cttggtgtat	atattaaatg	ttatttctgc	atatagggtc	180

ttttatggag	aaactgatga	tgataagctt	aatactcact	tgtttagcag	catctgaatg	240
cacaaatgct	ttatatatct	cttctgcttt	acagggcaaa	agatcagact	ctgttttctt	300
atagtcttca	caagccagcc	agaactcaat	attctcctca	ctgaattcag	actttaggaa	360
acttccaaag	acattttgac	cagtttggtt	ggcaagaagt	ttttccagag	attgagacca	420
ttgcattact	tcagcagcag	aaagtacatc	cttggaacttg	gaagatttca	ttccagattc	480
cagatgtggg	atcataga					498

<210> 43

<211> 312

<212> DNA

<213> Homo sapien

<400> 43

caggaaggcg	gccaagaatg	tgagtgcaaa	gattggttcc	tgagagcccc	gagaagaaaa	60
ttcatgacag	tgtctgggct	gccaagaag	cagtgcacct	gtgatcattt	caagggcaat	120
gtgaagaaaa	caagacacca	aaggcaccac	agaaagccaa	acaagcattc	cagagcctgc	180
cagcaatttc	tcaaacaatg	tcagctaaga	agctttgctc	tgcttttgta	ggagctctga	240
gcgcccatc	ttccaattaa	acattctcag	ccaagaagac	agtgagcaca	cctaccagac	300
actcttcttc	tc					312

<210> 44

<211> 417

<212> DNA

<213> Homo sapien

<400> 44

ctaacacatt	tactctccac	tattcgtact	ctggtagcca	tgtaaccccc	atcagagatt	60
ccttctcaag	ccatgtctca	gagctgagag	gcattccagc	aagttttgca	gctcacagtt	120
ttttccgtaa	attacttatt	ctataaaatt	ggagtaggcc	ataaaacttg	gagggcccta	180
gaccaatttt	ttggattatt	tttcgtcttc	tatcattccg	ctgatcttag	atattctctg	240
cattaaatat	taaatatcac	ttctaggctg	aaaaatcccc	ctaaaaatat	ttctagctca	300
gatttttctt	ccaaattctg	caatagaaga	tcacaatgtg	aactctgcat	ctccatgtta	360
aagtctaattg	gacattcaca	cttagcatgt	ctcaaagaaa	tctcatgtaa	accatgg	417

<210> 45

<211> 494

<212> DNA

<213> Homo sapien

<400> 45

cgctgtctg	tggtatgtgt	acacgtgcat	gttctgcatg	tctgtaggtc	acacatgctt	60
tggtgcatgt	acacgtgtgt	gtgtgtatgc	gtgtaggagc	tcacacttgt	gtacacgttt	120
gtgtgcatgc	atgtgtgcag	gagcttgac	gtttgtggtg	ggtacatgta	catatgtgag	180
tgatcctgtg	tgcaagcccc	catgtggaca	tggtatagag	tgagcgtgga	gcaaaaagcc	240
aggtaacacg	catgcagcag	gccactgtg	cgtgtctgag	acggctctgtg	gcagggactg	300
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gtgtgaatca	gtgaccgtgt	ctctgaccaa	catgctgaat	tacaaattga	taatttatta	420
acctgtgcag	caacaaataa	gatttttcaa	aactcaacaa	agtgtcctaaa	gttgacatta	480
cttgcttcaa	agtt					494

<210> 46

<211> 516

<212> DNA

<213> Homo sapien

<400> 46

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cttctattgc	taattttgtg	acctccaaag	ctttacttct	cggaacctcc	tcctttggcc	120
gtcatttgat	cattcaactc	tttgtcagtg	gcaactcccg	ctattttggt	gtgttggttt	180
gttactacac	agtgagcaca	aacatggtgg	tccaatacag	aggctcttcc	tgtcaggtgt	240
caaccagaaa	gttcactctaa	cactgtgata	tttgcatact	tcttgaacag	ttgttggtctg	300
aagattcatt	tgatgaatcg	atTTTTcaaa	agagatgatt	cttggttctt	ccgagcgctc	360
agctctcccg	ccgagcttct	ttgagacgtc	ctcaggtgtc	ctttgacgat	gcgtcctcca	420
ctttcacaca	ctctagcatt	ccttcactgg	ggtcttcatt	gccccacatt	gggcagccag	480
gaatgttggg	gtgatcagac	acaacaccag	gtcatg			516

<210> 47

<211> 459

<212> DNA

<213> Homo sapien

<400> 47

ccaattcaga	gtggcattct	gcatttctgt	ggcttccaag	tcttagaacc	tcaactgaca	60
tatagcattg	ggcacactcc	agcagacgcc	cgaattcaaa	tcctggaagg	atggaagaaa	120
cgcttgga	atatttgga	tgagacacca	ctgtattttg	ctccaagcag	cctctttgac	180
ctaaacttcc	aggcaggatt	cttaatgaaa	aaagaggtac	aggatgagga	gaaaaacaag	240
aaatttggcc	tttctgtggg	ccatcacttg	ggcaagtcca	tcccaactga	caaccagatc	300
aaagctagaa	aatgagattc	cttagcctgg	atttccttct	aacatgttat	caaactctggg	360
tatctttcca	ggcttccctg	acttgcttta	gtttttaaga	tttgtgtttt	tctttttcca	420
caaggaataa	atgagagggg	atcgaksaaa	aaaaaaaa			459

<210> 48

<211> 430

<212> DNA

<213> Homo sapien

<400> 48

cctatattca	gccacagcct	ctgggagtg	tgctgataat	cggagcttgg	aattaccctt	60
tcgttctcac	cattcagcca	ctgataggag	ccatcgctgc	aggaaatgct	gtgattataa	120
agccttctga	actgagtga	aatacagcca	agatcttggc	aaagcttctc	cctcagtatt	180
tagaccagga	tctctatatt	gttattaatg	gtgggtgttg	ggaaaccacg	gagctcctga	240
agcagcgatt	tgaccacatt	ttctatacgg	gaaacactgc	ggttggcaaa	attgtcatgg	300
aagctgctgc	caagcatctg	acccctgtga	ctcttgaact	gggagggaaa	agtccatgtt	360
atattgataa	agattgtgac	ctggacattg	tttgcagacg	cataacctgg	ggaaaataca	420
tgaattgtgg						430

<210> 49

<211> 288

<212> DNA

<213> Homo sapien

<400> 49

ccatccgaag	caagattkca	gatggcagtg	tgaagagaga	agacatatct	tacacttcaa	60
agctttggwg	caattcccat	cgaccagagt	tggtccgacc	agccttggaa	aggctactga	120
aaaatcttca	attggattat	gttgacctct	accttattca	ttttccagtg	tctgtaaagc	180
caggtgagga	agtgatccca	aaagatgaaa	atggaaaaaat	actatttgac	acagtggatc	240
tctgtgccac	gtgggaggcc	rtggagaagt	gtaaaagatgc	aggattgg		288

<210> 50

<211> 411

<212> DNA

<213> Homo sapien

<400> 50

ccagagaatg	acattcatgt	ccccgtggat	cccttgcaga	gagtacatgg	agccactgcc	60
accagtgggtg	atggaaagca	ctgtcttctt	actccggaag	ggtcctttgt	catacatggc	120
agcgtaagtg	taagcaaact	ctcctatgaa	cactcgtctca	aaccagcctt	tcagaatggc	180
agggactcca	aaccactgca	gggggaactg	gaatatacaca	aggtctgcgg	cttccagctt	240
cttttgttca	gccacaatat	ctgggctcag	atggccttct	ttataagcca	gaacagactc	300
ggcaggatac	tgaagttcgt	cagggctcct	cagtttacct	gtgatgtcct	ttctggaaat	360
gatggggattg	aagttcatgg	catagaggtc	cgactccacc	acctcccac	c	411

<210> 51

<211> 503

<212> DNA

<213> Homo sapien

<400> 51

gatatcttat	gattaaaaaac	aaatttaaatt	ttaaaacacc	tgaagatata	ttagaagaaa	60
ttgtgcaccc	tccacaaaaac	atacaaagtt	taaaagtttg	gatctttttc	tcagcaggta	120
tcagttgtaa	ataatgaatt	aggggccaaa	atgcaaaacg	aaaaatgaag	cagctacatg	180
tagttagtaa	tttctagttt	gaactgtaat	tgaatattgt	ggcttcatat	gtattatttt	240
atattgtact	tttttcatta	ttgatggttt	ggactttaat	aagagaaaatt	ccatagtttt	300
taatatccca	gaagtgaagac	aatttgaaca	gtgtattcta	gaaaacaata	cactaactga	360
acagaagtga	atgcttatat	atattatgat	agccttaaac	ctttttcttc	taatgcctta	420
actgtcaa	aattataacc	ttttaagca	taggactata	gtcagcatgc	tagactgaga	480
ggtaaacact	gatgcaatta	aga				503

<210> 52

<211> 503

<212> DNA

<213> Homo sapien

<400> 52

gatatcttat	gattaaaaaac	aaatttaaatt	ttaaaacacc	tgaagatata	ttagaagaaa	60
ttgtgcaccc	tccacaaaaac	atacaaagtt	taaaagtttg	gatctttttc	tcagcaggta	120
tcagttgtaa	ataatgaatt	aggggccaaa	atgcaaaacg	aaaaatgaag	cagctacatg	180
tagttagtaa	tttctagttt	gaactgtaat	tgaatattgt	ggcttcatat	gtattatttt	240
atattgtact	tttttcatta	ttgatggttt	ggactttaat	aagagaaaatt	ccatagtttt	300
taatatccca	gaagtgaagac	aatttgaaca	gtgtattcta	gaaaacaata	cactaactga	360
acagaagtga	atgcttatat	atattatgat	agccttaaac	ctttttcttc	taatgcctta	420
actgtcaa	aattataacc	ttttaagca	taggactata	gtcagcatgc	tagactgaga	480
ggtaaacact	gatgcaatta	aga				503

<210> 53

<211> 531

<212> DNA

<213> Homo sapien

<400> 53

tttttttttt	tttttaaaat	gaggatattt	tattattttca	ggtaattttc	ccagaggkga	60
gaatagtaca	tgggaaattc	tctttaggcc	aggtctagta	ttacagkgtg	gkgctcaagg	120
ccgcccata	gaacagtgat	actctcccaa	cagatttcat	ccaccccgct	tccactaact	180
tttgccataa	aaattcctct	gaattgtatc	ttcttggaag	aagtaaatat	ctgttcgact	240
atacaagaa	acagagaaac	cactcccat	gcaatcaatc	ttcaagagag	ggagcaggca	300

agccgtgttc	tttctgctga	gttttataga	ctctgacaag	ctgtgaaata	aacataaaca	360
gaagacaaaa	cagtgccaca	aataagcagt	agatgaccct	gtgacaagac	ggcattgcag	420
aacaaagact	gacgtttaa	ggggagtcac	gcagagtaac	atgggaacac	aagcctgaca	480
acctggtcag	cttccactta	ctctagctcc	tttgaactct	caacactaaa	a	531

<210> 54

<211> 450

<212> DNA

<213> Homo sapien

<400> 54

ccatgggtgt	ctggagcwcc	ctgaaactgt	atcaaagttg	tacatatttc	caaacatttt	60
taaaatgaaa	aggcactctc	gtgttctcct	cactctgtgc	actttgctgt	tgggtgtgaca	120
aggcatttaa	agatgtttct	ggcattttct	ttttatttgt	aagggtggtg	taactatggt	180
tattggctag	aaatcctgag	ttttcaactg	tatatatcta	tagtttgtaa	aaagaacaaa	240
acaaccgaga	caaacccttg	atgctccttg	ctcggcgctg	aggctgtggg	gaagatgcct	300
tttgggagag	gctgtagctc	agggcggtga	ctgtgaggct	ggacctgttg	actctgcagg	360
gggcatccat	ttagcttcag	gttgtcttgt	ttctgtatat	agtgacatag	cattctgctg	420
ccatcttagc	tgtggacaaa	gggggggtcag				450

<210> 55

<211> 648

<212> DNA

<213> Homo sapien

<400> 55

caacttcaac	cacaggctgc	tggasatgat	cctcarcaag	ccagggtctca	agtacaagcc	60
tgtctgcaac	cagggtggaat	gtcatcctta	cttcaaccag	agaaaactgc	tggattttctg	120
caagtcaaaa	gacattgttc	tggttgccta	tagtgctctg	ggatcccacc	gagaagaacc	180
atgggtggac	ccgaactccc	cggtgctctt	ggaggaccca	gtcctttgtg	ccttggcaaa	240
aaagcacaag	cgaaccccag	ccctgattgc	cctgcgctac	cagctrcagc	gtgggggttgt	300
ggtcctggcc	aagagctaca	atgagcagcg	catcagacag	aacgtgcagg	tgtttgaatt	360
ccagttgact	tcagaggaga	tgaaagccat	agatggccta	aacagaaaatg	tgcgatattt	420
gacccttgat	atttttgctg	gcccccttaa	ttatccattt	tctgatgaat	attaacatgg	480
agggcattgc	atgaggtctg	ccagaaggcc	ctgcgtgtgg	atggtgacac	agaggatggc	540
tctatgctgg	tgactggaca	catcgctctt	ggttaaatct	ctcctgcttg	gygayttcag	600
caagctacag	caaagcccat	tggccggaaa	aaatatcaag	ggtcaaat		648

<210> 56

<211> 536

<212> DNA

<213> Homo sapien

<400> 56

ctggcatgag	aatatttttt	tttttaagtg	cggtagtttt	taaactgttt	gtttttaaac	60
aaactataga	actcttcatt	gtcagcaaaag	caaagagtca	ctgcatcaat	gaaagttcaa	120
gaacctcctg	tacttaaaca	cgattcgcaa	cgttctgtta	ttttttttgt	atgtttagaa	180
tgctgaaatg	tttttgaaat	ttaaataaaca	gtattacatt	tttaaaactc	ttctctatta	240
taacagtcaa	tttctgactc	acagcagtga	acaaaccccc	actccattgt	atttggagac	300
tggcctccct	ataaatgtgg	tagcttcttt	tattactcag	tggacctgcc	cgggcggccg	360
ctcgaagccg	aattccagca	cactggcggc	cgttactagt	ggatccgagc	tcggtaccaa	420
gcttggccgt	aatcatggtc	atagctgttt	cctgtgtgaa	attgttatcc	gctcacaatt	480
ccacacaaca	tacgagccgg	aagcataaag	tgtaaagcct	gggggtgccta	atgagt	536

<210> 57

<211> 391

<212> DNA

<213> Homo sapien

<400> 57

aggaactact	gtcccagagc	tgaggcaagg	ggattttctca	ggtcatttgg	agaacaagtg	60
cttttagtagt	agtttaaagt	agtaactgct	actgtattta	gtgggggtgga	attcagaaga	120
aattttgaaga	ccagatcatg	ggtggtctgc	atgtgaatga	acaggaatga	gccggacagc	180
ctggctgtca	ttgctttctt	cctccccatt	tggacccttc	tctgccctta	catttttggt	240
tctccatcta	ccaccatcca	ccagtctatt	tatttgtcta	gttggatttc	atttcttctg	300
gaaaatttat	tgtttattgg	catgtgacct	ttgactgatg	gcttcattag	cattytggtt	360
ttcttttttg	atccttaata	gaaaactcaa	t			391

<210> 58

<211> 455

<212> DNA

<213> Homo sapien

<400> 58

gaagacatgc	ttacttcccc	ttcaccttcc	ttcatgatgt	gggaagagtg	ctgcaaccca	60
gccctagcca	acgccgcatg	agagggagtg	tgccgagggc	ttctgagaag	gtttctctca	120
catctagaaa	gaagcgctta	agatgtggca	gccccctctc	ttcaagtggc	tcttgtcctg	180
ttgccctggg	agttctcaaa	ttgctgcagc	agcctccacc	cagcctgagg	atgacatcaa	240
tacacagagg	aagaagagtc	aggaaaagat	gagagaagtt	acagactctc	ctgggcgacc	300
ccgagagctt	accattcctc	agacttcttc	acatggtgct	aacagatttg	ttcctaaaag	360
taaagctcta	gaggccgtca	aattggcaat	agaagccggg	ttccaccata	ttgattctgc	420
acatgtttac	aataatgagg	agcagggttg	actgg			455

<210> 59

<211> 398

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(398)

<223> n = A,T,C or G

<400> 59

ctcagaggca	gcgtgcgggt	gtgctctttg	tgaaattcca	ccatggcgta	ccgtggccag	60
ggtcagaaaag	tgcagaaggt	tatggtgcag	cccatcaacc	tcattcttcag	atacttataa	120
aatagatcgc	ggattcaggt	gtggctctat	gagcaagtga	atatgcggat	agaaggctgt	180
atcattgggt	ttgatgagta	tatgaacctt	gtattagatg	atgcagaaga	gattcattct	240
aaaacaaaagt	caagaaaaaca	actngntcgg	atcatgctaa	aaggagataa	tattactctg	300
ctacaaaagt	tctccaacta	gaaatgatca	atgaagttag	aaattggtga	gaaggatata	360
gtttgttttt	agatgtcctt	tgtccaatgt	gaacattt			398

<210> 60

<211> 532

<212> DNA

<213> Homo sapien

<400> 60

gacttctgag	acctgggggca	cccgggcttt	tgccggcagct	actgggcagg	cctggccacc	60
tcataggact	cagttccctt	ctgaacactc	gggggacatg	ggcctctaac	tgccactctt	120
gatatgcctg	ggtgagccta	ggaggggaagg	ctctgatttg	gatttctcca	gtcaaagctc	180

acagaaaaaa	acctggcact	ttgattttca	tgggatggtc	ctaacagggg	cagtcacctc	240
cgagcagttt	gggaacccag	tttcttgtec	tgggccctca	ggtcagcctg	gctgaattag	300
gacccttcct	tggcacaggg	gtgagaaaga	gcttggggaa	cgcttggcat	tatggagggc	360
tggaaggggc	tcaaccccga	tttggagaga	agtttgggat	ggagtgggcg	agagattgag	420
agagcgagca	ggaaaagagg	tcttggagcc	tgggactgat	ggtggataag	gcctggaaag	480
aasatgacsa	ggaggaggag	agagggaagt	gggtggatga	ggagcaggct	ga	532

<210> 61

<211> 466

<212> DNA

<213> Homo sapien

<400> 61

gcgacggcga	cgtctctttt	gactaaaaga	cagtgtccag	tgctccagcc	taggagtcta	60
cggggaccgc	ctcccgcgcc	gccaccatgc	ccaacttctc	tggcaactgg	aaaatcatcc	120
gatcggaaaa	cttcgaggaa	ttgctcaaag	tgctgggggt	gaatgtgatg	ctgaggaaga	180
ttgctgtggc	tgcagcgtcc	aagccagcag	tggagatcaa	acaggaggga	gacactttct	240
acatcaaaac	ctccaccacc	gtgcgcacca	cagagattaa	cttcaagggt	ggggaggagt	300
ttgaggagca	gactgtggat	gggaggccct	gtaagagcct	ggtgaaatgg	gagagtgaga	360
ataaaatggg	ctgtgagcag	aagctcctga	agggagaggg	ccccaagacc	tcgtggacca	420
gagaactgac	caacgatggg	gaactgatcc	tgaccatgac	ggcgga		466

<210> 62

<211> 548

<212> DNA

<213> Homo sapien

<400> 62

ttttgaattt	acaccaagaa	cttctcaata	aaagaaaatc	atgaatgctc	cacaatttca	60
acataccaca	agagaagtta	atttcttaac	attgtgttct	atgattatct	gtaagacctt	120
caccaagttc	tgatatcttt	taaagacata	gttcaaaatt	gcttttgaaa	atctgtattc	180
ttgaaaatat	ccttggtgtg	tattaggttt	ttaaatacca	gctaaaggat	tacctacttg	240
agtcacagc	accctcctat	tcagctcccc	aagatgatgt	gtttttgctt	accctaagag	300
aggttttctt	cttattttta	gataattcaa	gtgcttagat	aaattatgtt	ttctttaagt	360
gtttatggta	aactctttta	aagaaaattt	aatatgttat	agctgaatct	ttttggtaac	420
tttaaatctt	tatcatagac	tctgtacata	tgttcaaatt	agctgcttgc	ctgatgtgtg	480
tatcatcggt	gggatgacag	aacaaacata	tttatgatca	tgaataatgt	gctttgtaaa	540
aagatttc						548

<210> 63

<211> 547

<212> DNA

<213> Homo sapien

<400> 63

tttccaaagc	ggagacttcc	gacttcctta	caggatgagg	ctgggcattg	cctgggacag	60
cctatgtaag	gccatgtgcc	ccttgcccta	acaactcact	gcagtgtctt	tcataagacac	120
atcttgagc	atctttctta	aggctatgct	tcagtttttc	tttgtaagcc	atcacaagcc	180
atagtggtag	gtttgccctt	tggtagagaa	ggtgagttaa	agctggtgga	aaaggcttat	240
tgcattgcat	tcagagtaac	ctgtgtgcat	actctagaag	agtagggaaa	ataatgcttg	300
ttacaattcg	acctaatatg	tgcattgtta	aataaatgcc	atatttcaaa	caaaacacgt	360
aattttttta	cagtatgttt	tattaccttt	tgatatctgt	tgttgcaatg	ttagtgtgtg	420
tttaaatgt	gatcgaaaat	ataatgcttc	taagaaggaa	cagtagtgga	atgaatgtct	480
aaaagatctt	tatgtgttta	tggctctgcag	aaggattttt	gtgatgaaag	gggatttttt	540
gaaaaat						547

<210> 64
 <211> 528
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(528)
 <223> n = A,T,C or G

<400> 64
 cacctmctcc cscwggcgcc ttwctcsgac gccttgccca scggggccgcc cgacccccctg 60
 srccatggac cccgctcgcc csctggggmt gtygatckctg ctgcttttcc tgrckgaggc 120
 tgcactgggc gatgctgac argagccaac aggaaataac rcggagatct gkctcctgcc 180
 cctagactac kgaccctgcc kggccctact tytccgytac tactacgaca ggyacacgca 240
 gagctgccgc cwgttctctg rckggggctg crasggcaac rccaacwatt yctacacckg 300
 kgaggmttrc gackatgctw gstggargat agaaaaagtt cccaaasttt gccggctgma 360
 agtgaatgag gacnaccagg gtgaggggta cacagataag tatttcttta atctaakkwc 420
 catgacatgw gaaaaattct ttncgggtgg gngtcaccgg accggattga gaacangttt 480
 gcagatgang ctactgggat gggctcctgc rcacnaaaga aantatca 528

<210> 65
 <211> 547
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(547)
 <223> n = A,T,C or G

<400> 65
 kgaatgaasa acgaacgctg gaagtagaaa tagagcctgg ggtgagagac ggcattggagt 60
 acccctttat tggagaaggt gagcctcacg tggatgggga gcctggagat ttacggttcc 120
 gaatcaaaagt tgtcaagcac ccaatatttg aaaggagagg agatgatttg tacacaaatg 180
 tgacagtctc attagttgag tctactggtg gctttgagat ggatattact cacttggatg 240
 gtcacaaggt acatatttcc cgggataaga tcaccaggcc aggagcgaag ctatggaaga 300
 aaggggaagg gctccccaac tttgacaaca acaatatcaa gggctctttg ataatacatt 360
 ttgatgtgga ttttccaaaa gaacagttaa cagaggaagc gagagaangt atcaaacagc 420
 tactgaaaca agggtcagtg cagaaggat acaatggact gcaaggatat tgagagtga 480
 taaaattgga ctttgtttta aataaagtga ataagcgata tttattatct gcaagggttt 540
 ttttgtg 547

<210> 66
 <211> 535
 <212> DNA
 <213> Homo sapien

<400> 66
 ggggaggtct acgcttctag agcttgagcc agcggggcga ccttgcaagt gcaggactcg 60
 gcaccgcgcc ctccaccgcc ggttggtggc ctgctgaca gtttctctcc gtcgacatcg 120
 aaaggaagcc ggacgtgggc gggcagagag cttcatcgca gtaggaatgg cagcccatc 180
 tatgaaggaa agacaggtct gctggggggc ccgggatgag tactggaagt gtttagatga 240
 gaacttagag gatgcttctc aatgcaagaa gttaagaagc tctttcgaat caagttgtcc 300

ccaacagtgg	ataaaatatt	ttgataaaaag	aagagactac	ttaaaattca	aagaaaaatt	360
tgaagcagga	caatttgagc	cttcagaaac	aactgcaaaa	tcctaggctg	ttcataaaga	420
ttgaaagtat	tctttctgga	cattgaaaaa	gctccactga	ctatggaaca	gtaatagttt	480
gaatcatagt	gaacatcaat	acttgttccc	tatatacgac	acttgataat	taaga	535

<210> 67

<211> 527

<212> DNA

<213> Homo sapien

<400> 67

atcttctgcc	cttaattcaa	acagtcatat	gcaggctcgt	taattttatt	gtgcttttgt	60
ttcatcttct	acaaggccct	cttagctcta	aaacttgaca	gtggaataag	gaaatgtttt	120
tccaaatctg	cattgccggg	gagatcctca	acatcagcat	gttgagatgg	acctcaaccc	180
cacctctaac	cctgaaacac	actactcgat	attatcttag	gtatgtttta	gggtttagtt	240
tgtaaaataa	taattttatt	ttgaaggaaa	tataaaatat	taaagagtaa	taatagctat	300
cattttttta	gattcaatct	aaaacaatgg	actctttttt	tttccatttg	tgatgtagat	360
aagcaagaca	atcttgatca	tgagtgggtga	aaagaggatc	aaacttgact	attcttgcaa	420
tggcagtcga	gcaacaagcc	tttcattttac	attaaattat	aacttttcat	tcattcctaa	480
accaaactta	aaattctgct	ttcctttgag	tagaagggtat	ttaactt		527

<210> 68

<211> 431

<212> DNA

<213> Homo sapien

<400> 68

gggaaacttc	atgggtttcc	tcattctgtca	tgctgatgat	tatatatgga	tacattttaca	60
aaaataaaaa	gcgggaattt	tcctttcgct	tgaatattat	ccctgtatat	tgcatgaatg	120
agagatttcc	catattttcca	tcagagtaat	aaatatactt	gctttaattc	ttaagcataa	180
gtaaacatga	tataaaaaata	tatgctgaat	tacttggtgaa	gaatgcattt	aaagctattt	240
taaatgtgtt	tttattttgta	agacattact	tattaagaaa	ttggttatta	tgcttactgt	300
tctaattctgg	tggttaaaggt	attcttaaga	atttgcaggt	actacagatt	ttcaaaactg	360
aatgagagaa	aattgtataa	ccatcctgct	gwtccttttag	tgcaatacaa	taaaactctg	420
aaattaaaac	t					431

<210> 69

<211> 399

<212> DNA

<213> Homo sapien

<400> 69

gacacggcgg	acacacacaa	acacagaacc	acacagccag	tcccaggagc	ccagtaatgg	60
agagccccaa	aaagaagaac	cagcagctga	aagtcgggat	cctacacctg	ggcagcagac	120
agaagaagat	caggatacag	ctgagatccc	agtgcgcgac	atggaagggtg	atctgcaaga	180
gctgcatcag	tcaaacaccg	gggataaatc	tggattttggg	ttccggcgctc	aagggtgaaga	240
taatacctaa	agaggaacac	tgtaaaatgc	cagaagcagg	tgaagagcaa	ccacaagttt	300
aaatgaagac	aagctgaaac	aacgcaagct	ggtttttatat	tagatatattg	acttaaacta	360
tctcaataaa	gttttgacgc	tttcaccaar	aaaaaaaaa			399

<210> 70

<211> 479

<212> DNA

<213> Homo sapien

<400> 70
 cgcgccgag ctgtgagccg gcgactcggg tccctgaggt ctggattctt tctccgctac 60
 tgagacacgg cggacacaca caaacacaga accacacagc cagtcccagg agcccagtaa 120
 tggagagccc caaaaagaag aaccagcagc tgaaagtcgg gatcctacac ctgggcagca 180
 gacagaagaa gatcaggata cagctgagat cccagggtgct gggaagggaa atgcgcgaca 240
 tggaaggtga tctgcaagag ctgcatcagt caaacaccgg ggataaatct ggatttgggt 300
 tccggcgtca aggtgaagat aatacctaaa gaggaacact gtaaaatgcc agaagcaggt 360
 gaagagcaac cacaagttta aatgaagaca agctgaaaca acgcaagctg gttttatatt 420
 aggatatttg acttaaacta tctcaataaa gttttgcagc tttcaccaaa aaaaaaaaa 479

<210> 71
 <211> 437
 <212> DNA
 <213> Homo sapien

<400> 71
 ctcagcggct gccaacagat catgagccat cagctcctct ggggccagct ataggacaac 60
 agaactctca ccaaaggacc agacacagtg rgcaccatgg gacagtgtcg gtcagccaac 120
 gcagaggatg ctcaggaatt cagtgatgtg gagagggcca ttgagaccct catcaagaac 180
 tttcaccagt actccgtgga gggtaggaag gagacgctga ccccttctga gctacgggac 240
 ctggtcaccc agcagctgcc ccctctcatg ccgagcaact gtggcctgga agagaaaatt 300
 gccaacctgg gcagctgcaa tgactctaaa ctggagttca ggagtttctg ggagctgatt 360
 ggagaagcgg ccaagagtgt gaagctggag aggcctgtcc gggggcactg agaactccct 420
 ctggaattct tgggggg 437

<210> 72
 <211> 561
 <212> DNA
 <213> Homo sapien

<400> 72
 ggatggtata ctgtaaattc agcatatgga gataccatta tcataccttg ccgacttgac 60
 gtacctcaga atctcatgtt tggcaaattg aaatatgaaa agcccgatgg ctccccagta 120
 tttattgcct tcagatcctc tacaaagaaa agtgtgcagt acgacgatgt accagaatac 180
 aaagacagat tgaacctctc agaaaactac actttgtcta tcagtaatgc aaggatcagt 240
 gatgaaaaga gatttgtgtg catgctagta actgaggaca acgtgtttga ggcacctaca 300
 atagtcaagg tgttcaagca accatctaaa cctgaaattg taagcaaagc actgtttctc 360
 gaaacagagc agctaaaaaa gttgggtgac tgcatttcag aagacagtta tccagatggc 420
 aatatcacat ggtacaggaa tggaaaagtg ctacatcccc ttgaaggagc ggtggtcata 480
 attttttaaaa aggaaatgga cccagtgact cagctctata ccatgacttc caccctggag 540
 tacaagacaa ccaaggctga c 561

<210> 73
 <211> 916
 <212> DNA
 <213> Homo sapien

<400> 73
 ggagaaaaata aggtggagtc ctacttgttt aaaaaatatg tatctaagaa tgttctaggg 60
 cactctggga acctataaag gcaggtattt cgggccctcc tcttcaggaa tcttcctgaa 120
 gacatggccc agtcgaaggc ccaggatggc ttttgctgcg gcccctggg gtaggaggga 180
 cagagagaca gggagagtca gcctccacat tcagaggcat cacaagtaat ggcacaattc 240
 ttcggatgac tgcagaaaaat agtgttttgt agttcaacaa ctcaagacga agcttatttc 300
 tgaggataag ctcttttaaa gcaaaagcttt attttcatct ctcatctttt gtcctcctta 360
 gcacaatgta aaaaagaata gtaatatcag aacaggaagg aggaatggct tgctggggag 420

cccatccagg	acactgggag	cacatagaga	ttcacccatg	tttgttgaac	ttagagtc	cat	480
tctcatgctt	ttctttataa	ttcacacata	tatgcagaga	agatatgttc	ttgttaacat		540
tgtatacaac	atagcccca	atatagtaag	atctatacta	gataatccta	gatgaaatgt		600
tagagatgct	atatgataca	actgtggcca	tgactgagga	aaggagctca	cgcccagaga		660
ctgggctgct	ctcccggagg	ccaaaccca	gaaggctctg	caaagtcagg	ctcagggaga		720
ctctgccctg	ctgcagacct	cggtgtggac	acacgctgca	tagagctctc	cttgaaaaca		780
gaggggtctc	aagacattct	gcctacctat	tagcttttct	ttatTTTTTT	aactTTTTTg		840
ggggaaaagt	atTTTTTgaga	agtttgtctt	gcaatgtatt	tataaatagt	aaataaagtt		900
tttaccatta	aaaaaa						916

<210> 74

<211> 547

<212> DNA

<213> Homo sapien

<400> 74

agtggcatta	actTTTtagaa	tttgggctgg	tgagattaat	TTTTTTTaat	atcccagcta	60
gagatatggc	CTTTaaactga	cctaaagagg	tgtgttTgtga	TTTaatTTTT	tcccgttcc	120
TTTTcttcag	Taaacccaac	aatagtctaa	cctTaaaaat	Tgagttgatg	tccttatagg	180
tcactacccc	Taaataaaacc	Tgaagcaggt	gttttctctt	ggacatacta	aaaaatacct	240
aaaaggaagc	ttagatgggc	Tgtgacacaa	aaaattcaat	tactgtcatc	taatgccagc	300
TgtTaaaagt	gtggccactg	agcattttgat	TTtataggaa	aaaatagtat	TTTTgagaat	360
aacatagctg	Tgctattgca	catctgttgg	aggacatccc	agatttTgctt	atactcagtg	420
cctgtgatat	TgagttTtaag	gattttgaggc	aggggttaatt	attaaacata	Ttgcttctat	480
tctTggaaaa	atagaagkgt	aaaatgttaa	taatacaaat	gtcactgtga	cctcctccac	540
Tgagagg						547

<210> 75

<211> 793

<212> DNA

<213> Homo sapien

<400> 75

Tgaggaagtt	gcaagccaac	aaaaaagttc	aaggatctag	aagacgatta	agggaaaggtc	60
gttctcagtg	aaaatccaaa	aaccagaaaa	aaatgtttat	acaacccta	gtcaataacc	120
Tgaccttaga	aaattgtgag	agccaagttg	acttcaggaa	ctgaaacatc	agcaciaaaga	180
agcaatcatc	aaataattct	gaacacaaat	TtaatatTTT	TTTTTctgaa	Tgagaaacat	240
gagggaaatt	gtggagttag	cctcctgtgg	agttagcctc	ctgtggTaaa	ggaattgaag	300
aaaatataac	accttacacc	ctTTTTcatc	Ttgacattaa	aagttctggc	Taactttgga	360
atccattaga	gaaaaatcct	Tgtcaccaga	Ttcattacaa	Ttcaaatcga	agagttgtga	420
actgttatcc	cattgaaaag	accgagcctt	gtatgtatgt	Tatggataca	Taaaatgcac	480
gcaagccatt	atctctccat	gggaagctaa	gttataaaaa	taggtgcttg	gtgtacaaaa	540
ctttttatat	caaaaggctt	Tgcacatttc	Tatatgagtg	ggtttactgg	Taaattatgt	600
Tattttttac	aactaatttt	gtactctcag	aatgtttgtc	atatgcttct	Tgcaatgcat	660
atTTTTaat	ctcaaagctt	Tcaataaaa	catttttcag	atataaagag	aattacttca	720
rattgagtaa	Ttcagaaaa	ctcaagattt	aagtTaaaa	gtggTttgga	cttggggaaca	780
ggactttata	cct					793

<210> 76

<211> 461

<212> DNA

<213> Homo sapien

<400> 76

accttgca	attcccc	gtccatctat	cgaggctttt	gcaggaagca	tactgggaat	60
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tgaaacgaga	gcctaaatga	catctaagaa	aggcagtgtt	caataccagg	tattaggtga	120
ggatgggatt	ctaaggacat	cagtgggagg	cagggagcca	ccttcagacc	tcagcatgga	180
agcttccaag	atccagagga	agaggcaaca	gcactgagag	tcataggtag	aagaatcatc	240
acagccctgc	taaccaggca	gctgatgccc	ctctcccctg	gctccctgtg	tccaaatcct	300
acaggggcat	ctgttggctg	aactcaacct	gaagccaaag	agaagatgag	tggagagagg	360
caacatztat	agagctcagg	tttctagggc	tggagagggg	tctggaggga	cacacaggag	420
acacctggca	taaccaaaaa	atgattaaaa	aaaaaaaaaa	a		461

<210> 77

<211> 642 <212> DNA

<213> Homo sapien

<400> 77

ggttgcacga	aacacactgg	ggaatggagc	aaaacagtct	ttgaatatcg	aacacgcaag	60
gctgtgagac	tacctattgt	agatattgca	ccctatgaca	ttggtgggcc	tgatcaagaa	120
tttgggtgtg	acgttggccc	tgtttgcttt	ttataaacca	aactctatct	gaaatcccaa	180
caaaaaaaaa	ttaactccat	atgtgttctt	cttgttctaa	tcttgtcaac	cagtgcaggt	240
gaccgacaaa	attccagtta	tttatttcca	aaatgtttgg	aaacagtata	atltgacaaa	300
gaaaaatgat	acttctcttt	ttttgctgtt	ccaccaaata	caattcaaata	gctttttgtt	360
ttattttttt	accaattcca	atttcaaaat	gtctcaatgg	tgctataata	aataaacttc	420
aacactcttt	atgataacaa	aaaaaarawa	wattctttga	atcctagccc	atctgcagag	480
caatgactgt	gtccaccagt	aaaagataac	ctttctttct	gaaatagtca	aatacgaaat	540
tagaaaagcc	ctccctattt	taactacctc	aactggtcag	aaacacagat	tgtattctat	600
gagtcccaga	agatgaaaaa	aattttatac	gttgataaaa	ct		642

<210> 78

<211> 519

<212> DNA

<213> Homo sapien

<400> 78

gcagaagaag	aagcggacct	tccgcaagtt	cacctaccgc	ggcgtggacc	tcgaccagct	60
gctggacatg	tcctacgagc	agctgatgca	gctgtacagt	gcgcgccagc	ggcggcggct	120
gaaccggggc	ctgcggcgga	agcagcactc	cctgctgaag	cgcctgcgca	aggccaagaa	180
ggaggcgccg	cccatggaga	agccggaagt	ggtgaagacg	cacctgcggg	acatgatcat	240
cctacccgag	atgggtgggca	gcatggtggg	cgtctacaac	ggcaagacct	tcaaccaggt	300
ggagatcaag	cccagatga	tccggccacta	cctgggcgag	ttctccatca	cctacaagcc	360
cgtaaaagcat	ggccggccccg	gcatcggggc	caccactcc	tcccgttca	tcctctcaa	420
gtaatggctc	agctaataaa	aggcgccacat	gactccaaaa	aaaaaaaaaa	aaggcgggcc	480
gccaccgcgg	gggagctcca	cttttgttcc	ctttaatga			519

<210> 79

<211> 526

<212> DNA

<213> Homo sapien

<400> 79

gtctggaggc	ggtgtcctct	ccgccctgtc	gggtcctgga	tgagtacgag	ttatggtcac	60
ggtcacagcc	tgatctctta	tgtgttcata	gccattcgct	ctcccatcag	aactgtttgt	120
cctgaatgtg	ttcctctagt	tctagaaaat	gaccactaat	ttaaaaaact	cggttgtgag	180
gtttgcccag	aggcacttgt	tccagaattt	cccctcctgc	ttcagccatg	tccttgtcac	240
ttggcattct	aagctaaagc	tttagcttcc	caattcgtga	tgtgctaggc	caagattcgg	300
gagctgttgc	cagcctcgtc	aaatatggaa	gagaaacaac	ctgcggtcaa	aaggaggatga	360
tttgtttaagt	ggtgcgcgtc	tatctcataa	ctagatgtac	caaccaggga	agggccaagg	420
atggaaaggg	gtaacttttg	tgcttccaaa	gtagctaagc	agaagtgggg	gagcagttta	480

gccagatgat ctttgattag gcaaacattg agttttaaag aggctg 526

<210> 80
 <211> 281
 <212> DNA
 <213> Homo sapien

<400> 80
 gttatattag tgggtagtgt aacattttat ccagggtggg gtgaggggag atggccacag 60
 tagcaagtgg tgacactaaa taccattttg aaggctgatg tgtatatata tcattactgt 120
 ccgtagcaat gaaggatata gtactgtgtt gtgggtgagt gttgctattg cccagcatta 180
 atatttgggt gtgtatgttt gaggctatga aacacgcagg agtggttttg tgctattaat 240
 ttttaagagaa agcagctttt tcttaaaatt cactgttgag a 281

<210> 81
 <211> 405
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(405)
 <223> n = A,T,C or G

<400> 81
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 tagcaaaccg agcgatcatg tcgcacaaac aaatttacta ttcggacaaa tacgacsacg 120
 aggagtgtga statcgacat gtcagtctgc ccaaggacat akccaasctg gtccttaaaa 180
 cccatctgat gtctgaatct gaatggagga atcttggcng ttcagmagan tcagggatgg 240
 gtccattata tgatccatga nccagaacct cdcactctgc tgttcggcg scccacttac 300
 cccaanaaac caamgaaatg aaccttggct actacttttc aatcctcaaa kcttttcaca 360
 vhtgaccttc cttcctaaca ttctttmtga taaacattta ttaag 405

<210> 82
 <211> 547
 <212> DNA
 <213> Homo sapien

<400> 82
 tagtttttaa gaagaaatth tttttggcct atgaaattgt taaacctgga acatgacatt 60
 gttaatcata taataatgat tcttaaatgc tgtatggttt attattttaa tgggtaaagc 120
 catttacata atatagaaag atatgcatat atctagaagg tatgtggcat ttatttggat 180
 aaaattctca attcagagaa atcatctgat gtttctatag tcactttgcc agctcaaaag 240
 aaaacaatac cctatgtagt tgtggaagtt tatgctaata ttgtgtaact gatattaaac 300
 ctaaagtgtc tgcctaccct gttggtataa agatattttg agcagactgt aaacaagaaa 360
 aaaaaaatca tgcattctta gcaaaattgc ctagtatgtt aatttgctca aaatacaatg 420
 tttgatttta tgcactttgt cgctattaac atcctttttt tcatgtagat ttcaataatt 480
 gagtaatttt agaagcatta ttttaggaat atatagtkgt cacagtaaat atcttgtttt 540
 ttctatg 547

<210> 83
 <211> 529
 <212> DNA
 <213> Homo sapien

<400> 83

ctatttctaag	agatgctctt	agtgatcttg	cattacactt	tctgaataaa	atgaagatca	60
tggtgattaa	ggatattgaa	agagaagaca	ttgaattcat	ttgtaagaca	attggaacca	120
agccagttgc	tcatattgac	caatttactg	ctgacatgct	gggttctgct	gagttagctg	180
aggagggtcaa	tttaaagtgt	tctggcaaac	tgctcaagat	tacaggctgt	gccagccctg	240
gaaaaaacagt	tacaattgtt	gttcgtgggt	ctaacaaact	ggtgattgaa	gaagctgagc	300
gctccattca	tgatgcccta	tgtgttattc	gttgtttagt	gaagaagagg	gctcttattg	360
caggaggtgg	tgctccagaa	atagagttgg	ccctacgatt	aactgaatat	tcacgaacac	420
tgagtgggtat	ggaatcctac	tgcgttcgtg	cttttgcaga	tgctatggag	gtcattccat	480
ctacactagc	tgaaaatgcc	cggcctgaat	cccatttcta	cagtaacag		529

<210> 84

<211> 527

<212> DNA

<213> Homo sapien

<400> 84

cccatcacca	gaatcccttc	atgggagggg	tggtatgctg	ttgaaactca	ctgacctatt	60
ggactgacgc	tggggtggtg	tcttcatcag	agctattgta	agtcacccaa	aaggcttctg	120
acgaaaagac	aattttttaa	aagtcctctt	tttcaatcaa	gccaatgtcc	tattttatct	180
ctaaaagtgt	tgggactcgt	gctgttatca	agtacaatga	aaatggcttt	ataaatagct	240
gttttgacat	tgtgatagaa	ggcttgaata	cggaggaaag	atgtcgctgg	agctagtcct	300
gagttccgac	tgtccctgtg	gtgggaatcc	agtctgggaa	agcaggactg	tttttagcaa	360
cgtgtactcg	ttctataaaa	atggaatctg	ttctgcaggt	taccgtccct	ccccgcccaa	420
gcatcccttc	tgctctgtct	ctctgctgct	gggacccagg	gctttttcag	ctgcagaacc	480
cactggactt	ccaggaatca	aggaaaaagt	ggaaatgtcc	aactgtg		527

<210> 85

<211> 401

<212> DNA

<213> Homo sapien

<400> 85

cagtgtgggtg	gaattcccaa	gatagaaatg	aaaaactctt	ttatagagtg	ctgacatctg	60
acattgagaa	attcatgcct	attgtttata	ctccactgtg	gggtctggct	tgccaacaat	120
atagtttggt	gtttcggaa	ccaagaggct	tctttattac	tatccacgat	cgagggcata	180
ttgcttcagt	tctcaatgca	tggccagaag	atgtcatcaa	ggccattgtg	gtgactgatg	240
gagagcgtat	tcttggcttg	ggagaccttg	gctgtaatgg	aatgggcata	cctgtgggta	300
aattggctct	atatacagct	tgcggaggga	tgaatcctca	agaatgtctg	cctgtcattc	360
tggtatgtggg	aaccgaaaat	gaggagttac	ttaaagatcc	a		401

<210> 86

<211> 547

<212> DNA

<213> Homo sapien

<400> 86

gaagcctctt	gtgtttgtgt	gcagagaagt	atatgatcca	ccatgctaata	gacacttgcc	60
tttttttcca	ccattaaggc	tttaagaaca	tgtggaataa	gttttttagc	tgctaatagac	120
aaaacaaatc	ctgtaactac	ccagccagca	agtatatagc	acagaacact	gtgttacttt	180
acaagggctt	atgtgactgg	aataagggtg	tcccacttga	ctgttccaaa	gagcagcttc	240
tcagatcttc	agtgttcact	ggtaaatttc	taacagtgtg	tttggtgtaa	gtttgtcatt	300
tcatactcca	tacactacag	ttgctgtcac	tgatccctgt	tttgctggct	tttaagctac	360
ttgggtcaaaa	atcctgcttc	cttaaaacat	agagaattaa	tgagcatctc	aagctttttc	420
ttttcctttt	taatgatgcc	tgcactatca	agagtattct	agtgttctct	ctttgtttgg	480

catataatca tgcaccaaac tttttatttc ttttaagggtgg gagtatattt ttatttccta 540
aatgcca 547

<210> 87
<211> 530
<212> DNA
<213> Homo sapien

<400> 87
atggattcga aataccagkg tgtgaagctg aatgatggtc acttcatgcc tgtcctggga 60
tttggcacct atgcgcctgc agaggttcct aaaagtaaag ctctagaggc cgtcaaattg 120
gcaatagaag ccgggttcca ccatattgat tctgcacatg tttacaataa tgaggagcag 180
gttggactgg ccatccgaag caagattgca gatggcagtg tgaagagaga agacatattc 240
tacacttcaa agctttggag caattcccat cgaccagagt tgggccgacc agccttggaa 300
aggtcactga aaaatcttca attggactat gttgacctct atcttattca ttttccagtg 360
tctgtaaagc caggtgagga agtgatccca aaagatgaaa atggaaaaat actatttgac 420
acagtggatc tctgtgccac rtgggaggcc atggagaagt gtaaagatgc aggattggcc 480
aagtccatcg ggggtgtccaa cttcaaccac aggctgctgg agatgatcct 530

<210> 88
<211> 529
<212> DNA
<213> Homo sapien

<400> 88
acctgagcta agaaggataa ttgtcttttg gtaactaggt ctacaggttt acattttttct 60
gtgttacact caaggataaa ggcaaaatca attttgtaat ttgttttagaa gccagagttt 120
atctttttcta taagtttaca gcctttttct tatatataca gttattgcca cctttgtgaa 180
catggcaagg gactttttta caatttttat tttattttct agtaccagcc taggaattcg 240
gttagtactc atttgtattc actgtcactt tttctcatgt tctaattata aatgaccaa 300
atcaagattg ctcaaaaagg taaatgatag ccacagtatt gctccctaaa atatgcataa 360
agtagaaaatt cactgccttc cctcctgtc catgaccttg ggcacaggga agttctggtg 420
tcatagatat cccgttttgt gaggtagagc tgtgcattaa acttgcacat gactggaacg 480
aagtatgagt gcaactcaaa tgtgttgaag atactgcagt catttttgt 529

<210> 89
<211> 547
<212> DNA
<213> Homo sapien

<400> 89
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cacacaagggt tatgattttt ttaattactg gcttctgatt tctttcactt ctgacccctt 120
tcctttttct cagatgtagc tgagtcttga tcattttaag acaacgatgg gtagaatttt 180
gagattaatg ttaattttcc ctttttggtta atttcagtc cctctcacta tgcttttgtc 240
cagaaggatc aagaattcta ccatcccttg ggtctttgtg tataaacaat gttaaataaa 300
ggtagactca gtctttaaga tattagacag tttttttagt ccatgggatt gtaaataata 360
acattaactt tcctataaga atattttggc tttgtaatct atagccctcaa attggatttt 420
attatggatt cactagacaa acagctgttt ccttattgtc ttttttcttt agtgtttctg 480
atttgctatc agtagctgtt tttaaagcca tccaaggaaa ataattattt acagtttttg 540
aagtcac 547

<210> 90
<211> 528
<212> DNA

<213> Homo sapien

<400> 90 :

gagcagcaga	agctgtacag	caagatgac	gtggggaacc	acaaggacag	gagccgctcc	60
tgagcctgcc	tccagctggc	tggggccacc	gtgcgggggtg	ccaacgggct	cagagctgga	120
gttgccgccc	ccgccccac	tgtgtgtg	ttccagact	ccagggctcc	ccgggctgct	180
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tgtttctttt	acaataagtt	gttggaggaa	tgccattaaa	gtgaactccc	cacctttgca	360
cgctgtgcgg	gctgagtgg	tggggagatg	tggccatgg	cttgtgctag	agatggcggt	420
acaagagtct	gttatgcaag	cccgtgtgcc	agggatgtgc	tgggggcggc	caccgctct	480
ccaggaaagg	cacagctgag	gcactgtggc	tggcttcggc	ctcaacat		528

<210> 91

<211> 547

<212> DNA

<213> Homo sapien

<400> 91

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gacatataga	actttacaaa	catatgtcca	aggactctaa	attgagactc	ttccacatgt	120
acaatctcat	catcctgaag	cctataatga	agaaaaagat	ctagaaactg	agttgtggag	180
ctgactctaa	tcaaatgtga	tgattggaat	taraccmttt	ggscyttgra	ccttymtwrg	240
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tactatyctk	gttwatat	ttaaatackga	aagggtgctat	gcttctgtta	ttattccaag	360
actggagata	ggcaggggcta	aaaaggtatt	attatttttc	ctttaatgat	ggtgctaaaa	420
ttcttcctat	aaaattcctt	aaaaataaag	atgggtttaat	cactaccatt	gtgaaaacat	480
aactgttaga	cttcccgttt	ctgaaagaaa	gagcatcggt	ccaatgcttg	ttcactgttc	540
ctctgtc						547

<210> 92

<211> 527

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(527)

<223> n = A,T,C or G

<400> 92

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ttggggtaac	aggatgggta	cctgtcacgg	cctgtgcaaa	cataacatgt	gtcaccacac	120
tgaaggtagt	gtggaacaag	tggcctcacc	aaggctcgac	cccaatggac	tttttgctc	180
ttgggagctt	atgggtctat	gaggacacag	tagcctttcc	tatcagcaaa	ctggagtggga	240
tggtgtatct	gggggtggcc	ttatgtacct	gctactgttc	tccccacatt	gccagatgc	300
ctgtataact	gggaggcact	gkgctctcag	tttttgcgaa	tgtgatgagc	cccctgggtg	360
ttctaccctt	ttggcaatga	ctatccctgg	agnatgtgt	caaaactgta	aagcacaatt	420
tactgtctct	tgcggagcac	accgtcatg	ctctgaatta	cacctgaktg	tccctcctcc	480
wgktawtgaa	tgagggttgat	cnvatcagaa	adgtggkggt	ggcmata		527

<210> 93

<211> 531

<212> DNA

<213> Homo sapien

<400> 93

ggtattcata	cagccttcct	aaaggcaatg	ctttccacag	gattttaagat	accccagaaa	60
ggcatcctga	taggcatcca	gcaatcattc	cggccaagat	tccttggtgt	ggctgaacaa	120
ttacacaatg	aagggtttcaa	gctgtttgcc	acggaagcca	catcagactg	gctcaacgcc	180
aacaatgtcc	ctgccacccc	agtggcatgg	ccgtctcaag	aaggacagaa	tcccagcctc	240
tcttccatca	gaaaattgat	tagagatggc	agcattgacc	tagtgattaa	ccttcccaac	300
aacaacacta	aatttgtcca	tgataattat	gtgattcgga	ggacagctgt	tgatagtggg	360
atccctctcc	tcactaattt	tcaggtgacc	aaactttttg	ctgaagctgt	gcagaaatct	420
cgcaagggtg	actccaagag	tcttttccac	tacaggcagt	acagtgctgg	aaaagcagca	480
tagagatgca	gacaccccag	ccccattatt	aatcaacct	gagccacatg	t	531

<210> 94

<211> 547

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(547)

<223> n = A,T,C or G

<400> 94

gttaaacaatg	gtctgcgtgc	cttaagagag	acgcttcctg	cagaacagga	cctgactaca	60
aagaatgttt	ccattggaat	tggttgtaaa	gacttgaggt	ttacaatcta	tgatgatgat	120
gatgtgtctc	cattcctgga	aggtcttgaa	gaaagaccac	agagaaaggc	acagcctgct	180
caacctgctg	atgaacctgc	agaaaaggct	gatgaaccaa	tggaaacatta	agtgataagc	240
cagtctatat	atgtattatc	aaatatgtaa	gaatacaggc	accacatact	gatgacaata	300
atctatactt	tgaacaaaaa	gttgcagagt	ggtggaatgc	tatgttttag	gaatcagtcc	360
agatgtgagt	tttttccaag	caacctcact	gaaacctata	taatggaata	cattttttctt	420
tgaagggtgc	tgtataatca	ttttctagaa	agtatgggta	tctatactaa	tgttttttata	480
tgaagaacat	aggtgtcttt	gtgggttttaa	agacaactgt	gaaataaaaat	tgtttcaccg	540
cctggtgn						547

<210> 95

<211> 1265

<212> DNA

<213> Homo sapien

<400> 95

gtggtcaagc	agtgattttt	ctgggactgc	agaagttcct	gctgtgcccc	acctttatta	60
ctaactggga	aagaccagag	gagactggga	tgggctcatg	attctacata	cagaactcat	120
ccaagaaaagg	aggaaaagct	gattttttgtg	aacgtcgcta	cttgtgcttg	aactaactct	180
caggcacatt	agtcagaaaa	tactacctat	ggttactccc	ccaggttcct	aaaagtaaag	240
ctttagaggc	caccaaattg	gcaattgaag	ctggcttccg	ccatattgat	tctgctcatt	300
tatacaataa	tgaggagcag	gttggactgg	ccatccgaag	caagattgca	gatggcagtg	360
tgaagagaga	agacatattc	tacacttcaa	agctttgggtg	caattcccat	cgaccagagt	420
tggtccgacc	agccttggaa	aggtcactga	aaaatcttca	attggattat	gttgacctct	480
accttattca	ttttccagtg	tctgtaaagc	caggtgagga	agtgatcccc	aaagatgaaa	540
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gtaaagatgc	aggattggcc	aagtccatcg	gggtgtccaa	cttcaaccgc	aggcagctgg	660
agatgatcct	caacaagcca	gggctcaagt	acaagcctgt	ctgcaaccag	gtggaatgtc	720
atccttactt	caaccagaga	aaactgctgg	atttctgcaa	gtcaaaaagac	attgttctgg	780
ttgcctatag	tgctctggga	tcccaccgag	aagaaccatg	ggtggaccgc	aactccccgg	840
tgctcttgga	ggacccagtc	ctttgtgcct	tggcaaaaaa	gcacaagcga	accccagccc	900

tgattgccct	gcgctaccag	ctrcagcgtg	gggttgtggt	cctggccaag	agctacaatg	960
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aagccataga	tggcctaaac	agaaatgtgc	gatatttgac	ccttgatatt	tttgctggcc	1080
cccctaatta	tccattttct	gatgaatatt	aacatggagg	gcattgcatg	aggtctgcca	1140
gaaggccctg	cgtgtggatg	gtgacacaga	ggatggctct	atgctggtga	ctggacacat	1200
cgctctggt	taaatctctc	ctgcttggtg	atttcagcaa	gctacagcaa	agccattgg	1260
ccaga						1265

<210> 96

<211> 568

<212> DNA

<213> Homo sapien

<400> 96

ccagtgtggt	ggaattcggg	ttaattacaa	aatttgatca	cgatcatatt	gtagtctctc	60
aaagtgtctc	agaaattgtc	agtggtttac	atgaagtggc	catgggtgtc	tggagcacc	120
tgaaactgta	tcaaagtgtg	acatatttcc	aaacattttt	aaaatgaaaa	ggcactctcg	180
tgttctctc	actctgtgca	ctttgctggt	gggtgtgacaa	ggcattttaa	gatgtttctg	240
gcatttttct	tttatttgtg	aggtggtggt	aactatggtt	attggctaga	aatcctgagt	300
tttcaactgt	atatatctat	agtttgtaaa	aagaacaaaa	caaccgagac	aaaccttga	360
tgtctcttgc	tcggcggttg	ggctgtgggg	aagatgcctt	ttgggagagg	ctgtagctca	420
gggcgtgcac	tgtgaggctg	gacctgttga	ctctgcaggg	ggcatccatt	tagcttcagg	480
ttgtcttgtt	tctgtatata	gtgacatagc	attctgctgc	catcttagct	gtggacaaag	540
gggggtcagc	tggcatgaga	atattttt				568

<210> 97

<211> 546

<212> DNA

<213> Homo sapien

<400> 97

ttgtaccgta	tctgtaggca	tctgttaa	aattccaagg	ggaaaactaa	acgaggacgt	60
gggttgtatc	ctgccagggt	gagtggggct	cacacgctag	ggtgagatgt	cagaaagcgc	120
ttgtatttta	aacaaccaa	agaattgtg	agggtggctt	gctgccaggc	ttgcaactgcc	180
gttcctgggg	gtgtgcatct	tcgggaaagg	tgggtggcgg	gcgtccacta	ggtttctctg	240
cccctgctgc	tccttccgta	agaaaatgaa	atattctatg	cctaatactc	acacgcaaca	300
tttcttgtac	tttgtaaagc	gtttgcgaga	atgcagacca	cctcactaaa	ctgtaaacgg	360
taaagagatt	tttacttttg	gtctccgtga	gtcgcacatc	tactaagggt	tacacaggaa	420
ttccacctga	agacttgtgt	taaagttcta	cagcgcgcac	tgtaactga	acgtcttttt	480
cttcagccta	tacgcggatc	cttgttttga	gctctcagaa	tcactcagac	aacattttgt	540
aactgc						546

<210> 98

<211> 547

<212> DNA

<213> Homo sapien

<400> 98

tactgggtgc	caagctatgt	gccaggcact	ttacatgtat	tgattttaaca	cttaacagcc	60
actctatatt	attccctttt	tacagatgag	gcaattttaag	ctcaaagcat	ttaagtagac	120
aaccaaccta	gaatcacata	gcaaatgaca	gaagccagag	gcctcccaag	tctctctaac	180
tccaaaccct	atgcttactc	tactatatca	cactaccttg	caataggaca	aaggggaatat	240
gtggtaaaact	atgttcccag	catctaaaag	ccaggagtgg	ttttcatttt	tctttaagaa	300
gatgatagtg	tgattttgaaa	catatctgaa	tttcagaaga	ggggactttt	aaaaattgcc	360
actcataagg	aaagaaagaa	ctttttcaca	tatttttgaa	agaaacgatg	gtgagaagat	420

attcttgata atagagatat gctaacattt gctttgggtg ttttgtaggt tagatttttt	480
tggtgtgtac tttataggct tgcatattgc ttactttaaa cagctgaagt tctaagtaag	540
agtgttc	547

<210> 99
 <211> 122
 <212> DNA
 <213> Homo sapien

<400> 99	
cagcctttct gtcacatct ccacagccca cccatcccct gagcacacta accacctcat	60
gcaggcccca cctgccata gtaataaagc aatgtcactt ttttaaaaca aaaaaaaaaa	120
aa	122

<210> 100
 <211> 449
 <212> DNA
 <213> Homo sapien

<400> 100	
ctgacggctt tgctgtccca gagccgccta aacgcaagaa aagtcgatgg gacagttaga	60
ggggatgtgc taaagcgtga aatcagttgt ccttaatttt tagaaagatt ttggttaacta	120
ggtgtctcag ggctgggttg gggcccaaag tgtaaggacc ccctgccctt agtggagagc	180
tggagcttgg agacattacc cttcatcag aaggaatttt cggatgtttt cttgggaagc	240
tgttttggtc cttggaagca gtgagagctg ggaagcttct tttggctcta ggtgagttgt	300
catgcgggta agttgaggtt atcttgggat aaagggctct ctagggcaca aaactcactc	360
taggtttata ttgtatgtag cttatatattt ttactaaggt gtcaccttat aagcatctat	420
aaattgagtt ctttttctta gttgtatgg	449

<210> 101
 <211> 131
 <212> DNA
 <213> Homo sapien

<400> 101	
ccatgttctc tcttgactac gcatatgtga gatttgcccc tccgccccgc tcgtgatagc	60
catccagatc ttttacctgg ccctgtcttg gagaatctgt tttcaatctc cactgattgc	120
ccccctgctg g	131

<210> 102
 <211> 199
 <212> DNA
 <213> Homo sapien

<400> 102	
ctgctgcgcc tgatgctggg acagccccgc tcccagatgt aaagaacgcg acttccacaa	60
acctggattt tttatgtaca accctgaccg tgaccgtttg ctatatctct ttttctatga	120
aataatgtga atgataataa aacagctttg acttgaaaaa aaaaaaaaaa aaaaaaaaaa	180
aaaaaaaaaa aaaaaaaaaa	199

<210> 103
 <211> 321
 <212> DNA
 <213> Homo sapien

<400> 103

tttttttaggt	tttttaaactt	tttattttgca	tattaaaaaaa	attgtgcatt	ccaataatta	60
aaatcatttg	aacaaaaaaa	aatggcactc	tgattaaact	gcattacagc	ctgcaggaca	120
ccttggggcca	gcttgggtttt	actctagatt	tcactgtcgt	cccacccccca	cttctttcac	180
cccactttttt	ccttcaccaa	catgcaaagt	ctttccttcc	ctgccaccca	gataatatag	240
acagatggga	aaggcaggcg	cggccttcgt	tgtcagtagt	tctttgatgt	gaaaggggca	300
gcacagtcac	ttaaacttga	t				321

<210> 104

<211> 309

<212> DNA

<213> Homo sapien

<400> 104

ttttttttttt	ttttttatttt	ttttttttgca	tcaaaaaaact	ttattttccat	ttggcccaag	60
gcttggttagg	atagttaaaa	aagctgccta	ttggctggag	ggagagggtt	aggcaaaacc	120
cctattacttt	tgcaagggggc	ccttcaaaaag	tctctggggt	tctattttcaa	ccgcgatgat	180
gtggctctgg	aaggcgtgag	ccacttttttc	cgggaactgg	ccaaggaaaa	gccccaggggc	240
tacaaccgtt	tcctgaaaaat	gcaaaaccag	cggggcgggc	gcgctctttt	ccaggacatc	300
aaaaagcca						309

<210> 105

<211> 591

<212> DNA

<213> Homo sapien

<400> 105

cttattttctg	catgggtcgg	agagtggggcg	ggactgcttt	actgagttat	agtgaatgta	60
gttttaacct	aagcgctca	catgactaac	tcctcatcca	tcaagaatga	gctcagctct	120
cacttccccca	ctcctcacc	ccctgtaaag	taacctttct	ccaaggttat	gcttcaacag	180
gaatagctaa	cattttattaa	attgtggcac	gtaagtatct	tggatatatt	ggctcattga	240
atcctcacac	ctactatttt	acagagatgc	cagtggggct	tgagattgaa	tcacttgccc	300
aggctcccac	tgctggtaaa	cagtagaggg	ggctcctgac	ccatcagttc	ggcttgacaa	360
cccattccct	caactgcgga	tcccggattc	ccttatcacc	ctgttgattt	ctccataggc	420
tgtggtaaca	tttgttgcat	gaatggaccg	ttgaaatagg	gcctggcagg	gagaaattca	480
ggaaatgaat	gaatggttct	tccttggcag	cctttgatga	cttacaagcc	ccttcaaggg	540
ggaaagccat	ttttctccct	gggactcctt	gaaagcccgg	gagccctgcc	t	591

<210> 106

<211> 450

<212> DNA

<213> Homo sapien

<400> 106

ctgccactcc	tgctcttgct	accccgaaac	cggagagggga	gctcaataat	aacacagggtc	60
ccactaaact	aattaagggtg	ttggcataac	ctgtcattga	attcaagtgt	ccaacaactg	120
tttgcttaaa	atatcattag	acctaataat	tttttcaaag	gcacaaaagt	taaacatggg	180
gggggcggggt	gttgagaggg	gtctgggata	cccttaaacc	caaaaaagtg	atttgttccc	240
ccttgcccag	aaggggtgact	gttccactgg	gcctgtcacc	acaggacatt	ttccatgaca	300
agcactcacc	ttcttgggga	aggggcatca	ggttggcaca	ggaaaggccc	aagtgagggg	360
ccactctgta	cattaatact	ttgggtgatta	atgtttgggg	agaggcagga	ttctcaccca	420
cctttttgac	ttcaaact	ctcactcaag				450

<210> 107

<211> 116

<212> DNA

<213> Homo sapien

<400> 107

tcgacgaaag ttactgtcac tcagttgtaa atccatcagc ttttcacctg ttaaaaattt	60
tgcaaaatat acatgttctc ctctgtttt caattcttcc atcttttttc ttgagg	116

<210> 108

<211> 291

<212> DNA

<213> Homo sapien

<400> 108

ctgctcgaag ttgtcaaaac ccacgtgcag ggcaatggag agtccgatgg ccgaccacag	60
cgagtagcgt cctcccaccc aatcccagaa ctcgaaatg ttttgagggg caattccaaa	120
ctccttcact ttggttgtgt tagtagacag ggcaacaaag tgcttcgcca ctgcagtagg	180
atccttgggc gcctggagaa accactcctt cgccgtctct gcattcgtga tggctcctg	240
ggtagtaaaag gtcttgagg caatgatgaa caggaggagac tcgggggttca g	291

<210> 109

<211> 662

<212> DNA

<213> Homo sapien

<400> 109

gctgtttcca cagtacgcct gcctcacacc ttgcatgctg ccaacatcac catcattgag	60
caccagaagt gtgagaacgc ctaccccgcc aacatcacag acaccatggg gtgtgccagc	120
gtgcaggaag ggggcaagga ctctgtccag ggtgactccg ggggccctct ggtctgtaac	180
cagtctcttc aaggcattat ctctgtgggc caggatccgt gtgcatcac ccgaaagcct	240
ggtgtctaca cgaaagtctg caaatatgtg gactggatcc aggagacgat gaagaacaat	300
tagactggac ccacccacca cagcccatca ccctccattt ccacttgggtg tttgggtcct	360
gttactctg ttaataagaa accctaagcc aagaccctct acgaacattc tttgggcctc	420
ctggactaca ggagatgctg tcaactaata atcaacctgg gggtcgaaat cagtgaagac	480
tggattcaaa ttctgccttg aaatattgtg actctgggaa tgacaacacc tggtttgttc	540
tctgttgat cccagcccc aaaagacagc tcttggaact tgccccgggg cgccccgctc	600
ggaaaggggg cgaaatttct tcaagaatat ttccatttcc acaaacttgg ggccgggggc	660
cc	662

<210> 110

<211> 323

<212> DNA

<213> Homo sapien

<400> 110

tctgtgaaa cagcccatth tctacctac tgtgggttgc tgctcaggag gaacgatata	60
cgccaatata agcaggaaat ctgcagctcc tctgctatgt gcctcagaac actttcaatt	120
tttctgggtc atgctctgat taggtatcat acataaaagc cagcatatta gtttaaattc	180
ctaacaaaaa actatatttt ccaaagtcac tatcatttgg gccaatgaag tgatcttttc	240
gtgctttgtt gagcttcac tttagggtcat ctcttcttcc ttcccatcca tgaagttcgg	300
catttccatg tgcaaattha cag	323

<210> 111

<211> 336

<212> DNA

<213> Homo sapien

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<400> 111
tccagtgcgc tccagcctta tctaggaaaag gaggagtggg tgtagccgtg cagcaagatt    60
ggggcctccc ccatcccagc ttctccacca tcccagcaag tcaggatata agacagtcct    120
cccctgaccc tcccccttgt agatatcaat tcctaaacag agccaaatac tctatatcta    180
tagtcacagc cctgtacagc atttttcata agttatatag taaatggtct gcatgatttg    240
tgcttctagt gctctcattt ggaaatgagg caggcttctt ctatgaaatg taaagaaaga    300
aaccactttg tatattttgt aataccacct ctgtgg                                336

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<210> 112
<211> 218
<212> DNA
<213> Homo sapien

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<400> 112
tttttttttt tttttttttt tccagtcagg agtattttta atcactgtct acagagacac    60
ctacatacac acacgggtgg ggaatgaacc caaagttttt aggtgaagtc tctcagggcc    120
caccctgctg cacagacctt cctcggttgc agagattctg ggcaaagcat ccgtgctctc    180
atgagattat cctggggaga tttagaagaa ttttgtgg                                218

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<210> 113
<211> 533
<212> DNA
<213> Homo sapien

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<400> 113
ctgcaccgac agttgcgatg aaagttctaa tctcttcctt cctcctgttg ctgccactaa    60
tgctgatgtc catggtctct agcagcctga atccaggggt cgccagaggc cacagggacc    120
gaggccaggc ttctaggaga tggctccaga aaggcgccca agaatgtgag tgcaaagatt    180
ggttcctgag agccccgaga agaaaattca tgacagtgtc tgggctgcca aagaagcagt    240
gccccgtgta tcatttcaag ggcaatgtga agaaaacaag acaccaaaagg caccacagaa    300
agccaaacaa gcatcccaga gcctgccagc aattttctca acaatgtcag ctaagaagct    360
ttgctctgcc tttgtaggag ctctgagcgc ccactcttcc aattaaacat tctcagccaa    420
gaagacagtg agcacaccta ccagacactc ttcttctccc acctcactct cccactgtac    480
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<210> 114
<211> 261
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G

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<400> 114
ccatatctgc tcggcgctac ttctttcttg gattgatcct gantgatgca ttggcgatgc    60
ctttggagaa ggacatgtga tgtgatggtc ttcacgttcc acatgtactc gggcaaatag    120
ggggacaaac tgaagttaaa caggtcgaaa cttagaggagc tgctgaccct ggagctgacc    180
actttcttgg ggaaaaggac acatgaaggt gctttgcaaa agctgatgag caatctggac    240
accaacatag gacaacaacg t

```

```

<210> 115
<211> 267

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<212> DNA

<213> Homo sapien

<400> 115

cctctcctgt ggggtccaga ccctgttcca gcaacaattg ctgggacacc tgggccgact	60
gctccacctc gccaggccct ggccctctcc atctcagccc tgacagccac ccagtataa	120
acacagcagg cttcctaagc aatgtgacgc accagagggg tgggtgtaca cgttcccctt	180
gaagtcattc gaaaattaga gaacagattt gcctcatagc tgaagagaga ccctattcca	240
agcatgaatg gccttgacaa tggtcct	267

<210> 116

<211> 239

<212> DNA

<213> Homo sapien

<400> 116

ctgatgacct ggggtctagt gaaaatgcag ggtcagattc agtgggtctg ggggtctgaat	60
ctctaaggcg ctgccaagt atgctgatgc tcttggttg tggaccacc tgtgtatagc	120
aaagctctag actaggaggt ctcaaccttg gctgcacaga attatctggg gagtttttaa	180
atttcccagt gccaggtc cattcatatc atagtagaga cagggttttg ccatgctgg	239

<210> 117

<211> 168

<212> DNA

<213> Homo sapien

<400> 117

aaaaaacttt tatattgctg catcttccac agttcttttg gtagtctctg aacttaaaat	60
ttgtaggagt ttagactac ctaaattttt aagttatgga tttgttcata ggtttagggg	120
gtaggtaaag aaggaaacag acaagaaaat ggcttcttga ggtggcag	168

<210> 118

<211> 150

<212> DNA

<213> Homo sapien

<400> 118

aaaaaaaaa gtttatattag aaagtatcat agtgtaaaca aacaaattgt accactttga	60
ttttcttgga atacaagact cgtgatgcaa agctgaagt tgtgtacaag actcttgaca	120
gttgtgtctt tctaggaggt tgggtttttt	150

<210> 119

<211> 154

<212> DNA

<213> Homo sapien

<400> 119

aaactgtgtg agatattaac cagccgccct gttataaaat caggaaatcc aaacagcgat	60
ttacaccgat taacaccccc ttttatattt tttcaaatac actgagaaaa taatcaaagc	120
ttttcatctc tcttgctttt ttttgttttt tctt	154

<210> 120

<211> 314

<212> DNA

<213> Homo sapien

<400> 120

ctgctgtggag	tgacgggagg	agggaatcac	tgtgtgtgcg	agagtgcctc	agactcaatt	60
tccaaaataa	ttttcacccc	tctaagcatg	taaattcaaa	gatggatcct	tcatagaaat	120
taaaaaatca	atttgagctc	atttcgaata	cagaacaagt	atggcacaga	tggaagtcct	180
gccacgtttc	ctttaatgat	gctgactcct	gtatcacaca	ggccagcatg	aagtttctta	240
ctcagacttt	acaggcattt	tccgtaattc	aatcagtcct	gctcccagca	caacacagga	300
ggtgattcga	gaat					314

<210> 121

<211> 601

<212> DNA

<213> Homo sapien

<400> 121

aaaaaaaaacc	taattcattg	aagtaataac	caaataatth	tcaatcttga	ttcaactgtg	60
attcaaattct	tacaccattt	gccccttcta	tgaatttatg	tataaaatth	tttaagagtc	120
agagtthttt	tttcttgatt	aattggatgt	atttcacaga	atttccaact	gctcacgtta	180
gttttcttcc	ttttagagtt	gatctctcta	atgtattaga	tcttcatgcc	tttgatagtc	240
tctctggaat	aagtttgag	aaaaaacttc	agcatgtgcc	aggaacacaa	cctcaccttg	300
atcagagtat	tgtacaatca	catttgacgt	accaggaaat	gcaaaggag	aacatcttaa	360
tatgtttatt	cagaatcttc	tgtgggaaaa	gaatgtgaga	aacaaggaca	atcactgcat	420
ggaggtcata	aggctgaagg	gattggtgtc	aatcaacgac	aaatcacac	aagtgtattg	480
ccaggggtgc	catgagctct	gtgatctgga	ggagactcca	gtgagctgga	aggatgacac	540
tgagagaaca	aatcgattgg	tcctcattgg	cagaaatth	gataaggata	tccttaaac	600
g						601

<210> 122

<211> 486

<212> DNA

<213> Homo sapien

<400> 122

ctgtttctaa	ttgcttttgt	gactgttacc	ttttagttca	tgccccccca	aagagctaaa	60
tttcacattt	ttacctacaa	aattgatttt	taattcctgc	aaataatth	ccattatgag	120
ctacaagggtg	ggcaacagcg	cctgaggatc	taattttatg	catattactc	ccaagtattt	180
taacacttgt	tggaagaagca	atatctggat	caataaaaca	ctgtcccatc	aaccatttga	240
gtggggagag	ggagaagctc	ttctgtaagt	aagattctgg	caagctcttt	gaaatgagtc	300
ttctttccca	cagattttct	ctactctttc	aatacaaca	gataggagaa	gaggggaatg	360
aaacctggag	gaacttgaat	atthttgttc	tagatagaga	tacagtatt	gaaaaggaaa	420
cctagaaaagt	agtcacacgt	cgcttattth	ggccagaagt	aattgtactg	ggcaaaaatt	480
tcactt						486

<210> 123

<211> 239

<212> DNA

<213> Homo sapien

<400> 123

ctggtgggtc	tttttttct	ctcagagctc	aagcctgtag	tgcttgatgt	catttctttc	60
aagttgcccc	cagtatctcc	acttaacta	ggctagtaac	caaaataatg	tggaaccttct	120
ttaggaaaca	gtgtgggaga	ataggagtcc	agccgtaaga	taaactggaa	atatttgggc	180
gtcttgtagc	tggttacgca	ccacctcagt	gttgcttcta	cataaacaag	gcccctttt	239

<210> 124

<211> 610
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(610)
 <223> n = A,T,C or G

<400> 124
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 ggaaatcgcc acngngcttt cggttttctt ggtgaaggaa tacaccgcgc cgacagcagg 120
 ttttcagtca gggtcaggga ctgttgcttg cgcgcgaaaa tcaccggtac gccgaggttc 180
 aggccggtca tgatcgccgg tgcaatgccc gaggtctcga tggtagcat cttggtgatg 240
 cccgaatcct tgaacaacgc agcgaattca tcaccgatca gtttcatcag cgccgggtcg 300
 atctggtggt tcagaaaggc gtcgacctg agtacctgat cggaagcac gatgccttct 360
 tcgcgaattt tcttgtgcag tgcttccacg aaagcttcct ctgttggcgc aacacgcgcc 420
 gaaagtagat taaaaagtag tcgattctag cgctttaaca tcgcgcgtat atccgccagg 480
 gcggtattgc cgcgaacggc tttgacttcg gttggtgtgt cgtcgttgcc ttcccatgcc 540
 aggtcatccg gcggcagttc gtcaaggaac cggctggggg cacaatcaat gatctcgccg 600
 tactgcttgc 610

<210> 125
 <211> 196
 <212> DNA
 <213> Homo sapien

<400> 125
 ctatagggct cgagcggccg cccgggcagg taaaaaatca gcccctaatt tctccatgtt 60
 tacacttcaa tctgcaggct tcttaaagtg acagtatcct taacctgcca ccagtgtcca 120
 ccctccggcc cccgtcttgt aaaaagggga ggagaattag ccaaactg taagctttta 180
 agaagaacaa agtttt 196

<210> 126
 <211> 247
 <212> DNA
 <213> Homo sapien

<400> 126
 aaattagtta aaaaaatgca ttctcattt gatatagcca cattccaaat gcttaaaagc 60
 cgcattgtatc tagtgactac catactggag agtacaaata tagaacttta cccgtcactg 120
 cagacagttc tgttgattg tgcagcattg gacaatatat acagtttgcc tgtatatgag 180
 aaagagagag agagagagag tgtgtgtgtg tgtgtgtgtg tgaagtgcaa taaggctgac 240
 aggcac 247

<210> 127
 <211> 590
 <212> DNA
 <213> Homo sapien

<400> 127
 cctccacggc atggcgcaat tgttgctcag gggccgccag gttgctgccc atgccgatgt 60
 agatacgttc cacgtgctta ctgccagac gcaactgaag cgtcgccagc gctacgtttg 120
 cgcttgctgc cactgctgcg gcgacgcttt ttccggccat cgccggtggc ttgcctttg 180
 ctgctgagct ctttgatcat ctgcggcgc tggctgtcgt tggcgtcctg gtagtcggtc 240

caccactcgc	caaggccgctc	ggtctgttcg	ccggcgcttt	cacgcagcag	caggaagtca	300
tagccccgca	cggaagcgcg	ggttgtccag	caacaggctc	gcacgtttgc	cgctgcggcg	360
tggcaggcgc	tcttgcattg	cccagatttc	acggatcggc	atggtgaagc	gtttcgggat	420
ggcgatgcgc	tggcattgct	cggcgatcag	ctcgtgagca	gcttcctgca	tggctggaat	480
tgccggcatg	ccacggctct	gcaggcgcat	gacgcgtttc	gaaagcgcg	gccacaacag	540
ggcggcaaa	aggaacgccg	gggtgaccgg	tttgttctgc	ttgatgcgca		590

<210> 128

<211> 361

<212> DNA

<213> Homo sapien

<400> 128

ctgccccatg	aaaccctcca	ggagctgctg	gacctgcaca	ggaccagtga	gagggaggcc	60
attgaagtct	tcatgaaaaa	ctctttcaag	gatgtaacca	aagtttccag	aaagaattgg	120
agactctact	agatgcaaaa	cagaatgaca	tttgtaaacy	gaacctggaa	gcctcctcgg	180
attattgctc	ggctttactt	aaggatattt	ttggtccctt	agaagaagca	gtgaagcagg	240
gaattttatt	taagccagga	ggccataatc	tcttcattca	gaaaacagaa	gaactgaagg	300
caaagtacta	tcgggagcct	cggaaaggaa	tacaggctga	agaagttctg	cagaaatatt	360
t						361

<210> 129

<211> 546

<212> DNA

<213> Homo sapien

<400> 129

aaaaatacaa	attcagtaag	acttttgctc	taacaacaat	ttttcaaaac	gaatcaacaa	60
caaaaaagta	tccagtgttt	cttttcttat	gaagatataa	taaaacacag	tattggtaag	120
cacattttta	cagtatgctt	ttcttttgta	gggaaaggag	atatggctat	gtctaaccatc	180
gtgggatcca	atgtgtttga	tatgttgtgc	cttggtattc	catggtttat	taaaactgca	240
tttataaatg	gatcagctcc	tgcagaagta	aacagcagag	gactaactta	cataaccatc	300
tctctcaaca	tttcaattat	ttttcttttt	ttagcagttc	acttcaatgg	ctggaaacta	360
gacagaaaag	tgggaatagt	ctgcctatta	tcataacttg	ggcttgctac	attatcagtt	420
ctatatgaac	ttggaattat	tggaaataat	aaaataagg	gctgtggagg	ttgatattat	480
taatagtgtt	atgcagaaaa	tatgaatggc	agggaggggc	agagagaaaa	atccatttct	540
tcattt						546

<210> 130

<211> 733

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(733)

<223> n = A,T,C or G

<400> 130

ggggcctctt	cctaaaggca	ctaattccat	ccaatagggc	ttaacctcat	gacttaatca	60
actttcaaag	acaccacatc	ctaattgccat	cacatcagaa	tttaggcttc	aacatatgaa	120
ttttgggggg	acacaaacat	tcacctcata	gcattcattg	tttcttggtt	ttggcaaagc	180
caagactcac	attgtctaa	ttatttgact	tttgagtccg	cagatgtgaa	aacagtgtca	240
aacagtccag	cttcatgagt	ggagaacagc	atttgtgaca	accaccaaag	tacctctgtg	300
gtcagtgtcc	tcaaccagg	cacagcatca	tggaccagag	cctctgcagg	gcacagagga	360

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gtggtgagga acaggggctc tggagcaacc ccacttcctt ctgctttgta tatgggggggt 420
tctgcacatg actgcatttg aaaagggctt cactgcgctt gctgaaggag tgcacttgag 480
ctagcggaga gttcccagag ggtgtctgga agaagcaaag gctattcttt gtttcaactca 540
gttatagatg gaagtcagac acttctgcct gaagtacttt cacacactcc acagtcttaa 600
gaaggatgga naaagcatgc caactactca naaaaccaca ggtgttcaag caatggtatc 660
cttttatncc tacaactagt ggacaaagng gggcctctgt aatttgggaa agctaggaaa 720
actttttctg ggg 733

```

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<210> 131
<211> 305
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1)...(305)
<223> n = A,T,C or G

```

```

<400> 131
aaacacatac gaatanntna actgtgatta tgaagtgaca gccggctaaa tatgtcttgt 60
atcttctctc ttcctttttt tgctaactca tcctttattc cattcctgct tccatggtaa 120
tgcaggctca aataaattac taggatacaa gattacttca agcctctttt ctgtggaact 180
cataatatga taagcatttg ttacaagatt gcctgtagtt gtttagggga caaattatat 240
tagggaaaga aagtctttct ttagttggtt aaattttcta ttataattgg gtactaaatt 300
tattt 305

```

```

<210> 132
<211> 545
<212> DNA
<213> Homo sapien

```

```

<400> 132
aaacaatgct acactcattt ttggcaaagt gctgtattgt tcagtctgtg tacaaaactg 60
accatctatg aaccaatcag tataaaaaat ttctataaaa acaaaattta gacagcggct 120
caagaaaaca agctgccatt tatgcataga ttgatgtaca gtaacctaac caaatgtccc 180
ttttgaattt tcaagttact gaaaaaaaaat gtgtcgagaa acacattaag aaggcacatg 240
tacagtctac aatactcttc agtctcccta actcatgccc tgcccctata aaggaaatat 300
gttcacaatt ttacttgaga aaaaaaaaaa aagccactta aaaaaaaaaa aacacacacg 360
caattattaa agttcaaaat ctctggagga aaatacaagc aaaccactc atacactcca 420
agcctgaaac acacatctaa cctccccagg tactggtttg gttttcagag gtccacctag 480
aaaacaaatc taaaacttca ggcaaaacag agcaaaactg gacatttaac aattacacaa 540
ttttt 545

```

```

<210> 133
<211> 330
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(330)
<223> n = A,T,C or G

```

```

<400> 133
aatattttatt actaatatct tataatgttt tgtggnacca tggcatacct tgggtactat 60

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tgtaacanat	agttcaggaa	accctactat	aaggttttatc	aaatggtctc	ataaacagtt	120
acttattcaa	gcacgccaaa	gctcagtcaa	aagtattttt	cacccttact	ctttctcgtg	180
tcattcaaag	agaagttttg	atgtagtgtg	tttattttgtg	gggagtaatg	aacagatcca	240
tttcacagta	gactttgtgc	tctaggtgat	gcagctaatt	gccccagttt	ggaaaacatg	300
gacttggatg	aattgtcttt	tgtttgggac				330

<210> 134

<211> 627

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(627)

<223> n = A,T,C or G

<400> 134

aaatattact	tcaaatacat	tttaaagctc	aacaaacttg	tgttgaactg	aattgcagat	60
cctgaactct	atltgaaaat	acatcatgaa	acagaaaanc	ccattccaaa	tgaaaatgat	120
agtgccttgt	tgggggtggg	aatgaggcgg	ggagactaaa	tactatttaa	cagacttctt	180
ttcccaatgc	aatttgtcaa	aagttcaaaa	gttctgaaat	gtactaaatc	ttaagcaa	240
taaattcatg	atattactaa	aactttttta	atagtgcgat	gacttatcaa	gttatagtgg	300
ctgcattaag	aacaaattat	tgtgtgaaat	acctgtataa	acacaaaata	caattaaata	360
tttctttaca	aaaagctgag	cattacgcat	aatagtgga	tgtctttcat	taggtgtatt	420
ttttaaaagt	taacaaaagt	aacatttcct	aaaatgtata	catgtgccat	atttttgcaa	480
acatgcctga	gaatgtattt	aaaacatttc	tgtagtaaga	gtttgcaaga	acttcacaaa	540
cctgcaataa	aaatgcatct	ttttaaaaag	gtgaaaatgg	catctccaca	ctgcaacaat	600
tcaaaaagtg	cagcatccct	aatcttt				627

<210> 135

<211> 277

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(277)

<223> n = A,T,C or G

<400> 135

aaaatcaaat	atattatttg	ttaaaaatca	gcttggttca	ttacnggaaa	ttacaccagt	60
ccgttctatt	tactttcaaa	ccatattcaa	ctcctcaact	ttcaaactg	taatcaacta	120
atttcaaaaag	ggaaaaggta	ccctttataa	aggagagatc	tggttaagaca	ccaagaaatc	180
aaaattaata	tcacttaata	attaagtggg	taacacatgc	ctcccaatac	agtgcagtga	240
gaaacacaaa	acatcaattc	ccgcgtactc	tgcgttg			277

<210> 136

<211> 486

<212> DNA

<213> Homo sapien

<400> 136

aaaacagaat	gaattcattg	ttacagttac	agaagtcaga	agcccaaata	cagtctgcct	60
gaaccaaagc	cagggtcagc	aaggttcctt	tccactgttt	tgccaacttc	tagaggccac	120
ctgtattcct	tgggtcatgg	cccctctctt	catcatcaaa	taatcagcat	agctttatga	180

cattggcagc	tctgattttg	ctcttttgcc	ttcctcttat	gtagaccctt	gtaattacat	240
tgggtacacc	cagataaccc	caaataatct	ccctatctca	agattcttaa	tgtaattata	300
ttgggaaagt	cccttttgtc	atataagata	acatagcaat	ggattccaag	gattagtatg	360
tgagtttctt	ttgaggggct	ataattaacc	ctaccacaat	atggaaatgt	ctattgtttt	420
tctatgtacc	agaaataaga	cattaggatg	tgaaattaat	aacataacac	cacttacggc	480
atcacc						486

<210> 137

<211> 552

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(552)

<223> n = A,T,C or G

<400> 137

ccatcttgca	tcaaatgttc	ttaaggcagt	gactggctat	caaccacagt	ttctgtctcc	60
ccagttgcaa	acacaggatc	catgcaacag	ttctgagacc	atacacttag	aaaccacagg	120
ggatgcggat	caaatgcaga	actcccaaat	tataaaacag	tcaggctaca	ctcaaaacaa	180
aacatagaac	atcaacaaca	cacatctccc	aaaaaagaag	tgcaacgcat	gcttgtataa	240
accaacaata	acaaaaaaac	cacaataaaa	aatgcagagt	ctcccaaaca	agttttcaaa	300
tgtattgcan	aaagaaaaaa	aatgtatata	tatataaaat	taaaaagtct	gaaatactag	360
tgcatagtca	attacctaac	accaagtttc	ttttctttct	gtccaagctc	tactgcccct	420
ctgatactag	cagcatgtct	acaggctaag	accatagcag	caaaaaacgt	ttttcatttg	480
gcatttacaa	aattaaatta	ctgaataaaa	atataatttt	ttataaaact	atttcttaca	540
gtaataattt	tt					552

<210> 138

<211> 231

<212> DNA

<213> Homo sapien

<400> 138

aaattttact	agtgttactt	aatgtatatt	ctaaaaagag	aatgcagtaa	ctaattgcct	60
aaatgtttga	tctctgtttg	tcattacttt	ttcaaaaatat	ttttttctgt	aaagtataat	120
atataaaact	tcttgcttaa	attgaatttc	tatattagtg	gttaattgca	gtttattaaa	180
gggatcatta	tcagtaattt	catagcaact	gttctagtgt	tttgtgtttt	t	231

<210> 139

<211> 535

<212> DNA

<213> Homo sapien

<400> 139

cagttgccaa	ccctctgaac	cgtttaggcc	ggttcatcgc	tgcttttgaa	tctgggccgg	60
tgggtgatccg	gcaaggggtg	aaaccaaaga	gcgggggctg	tgaggccctt	cgcagtcctt	120
cgtaagtcgc	tgcatggag	tgaactatca	cgcacgtgtg	ttatttcgtc	aacacgaaat	180
gtgatttatt	tttgcaatt	aacacggcag	ttctcggtta	cgttttcgga	aagcgtggga	240
tatgattctg	tctatcctgt	acggatatac	agtaattacc	gggaggggat	tccatggcga	300
agaagcaggc	ggcaccggca	gcacggcagg	aaatgagcgg	tatggcgcgc	ctcgggcttc	360
gcgtctcatc	gatgattaat	caccgggtcg	cccagacgca	gcgctgggtt	acgattcatc	420
gcctggacac	ggatggggat	cgggagtggt	aagaggttct	gagcgtgatc	gctgataccg	480
acgagctcga	gctgacgctc	aatgacgatg	gcagtggtgac	ggtgaggtgg	gagca	535

<210> 140
 <211> 640
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(640)
 <223> n = A,T,C or G

<400> 140
 acattggtgg cacttgaact gagtgcaaac cacaacattc ttcagattgt ggatgtgtgt 60
 catgacgtag aaaaggatga aaaacttatt cgtctaattg aagagatcat gagtgagaag 120
 gagaataaaa ccattgtttt tgtggaaacc aaaagaagat gtgatgagct taccagaaaa 180
 atgaggagag atgggtggcc tgccatgggt atccatgggt acaagagtca acaagagcgt 240
 gactgggttc taaatgaatt caaacatgga aaagctccta ttctgattgc tacagatgtg 300
 gcctccagag ggctagggtta gtacaaactc gcattcatgg cttggtttcc cagaagatct 360
 ccatttaact tttttaaaga aagtttattg ctttctttta cctgcatttt ttctaagttt 420
 tttttcgcac aaagggtgctg tctttgtggc aaggcctagg catgacaatc ggaggactcg 480
 aggggggatgg aggactagtg atccggctgg ctgcttccag tcgattagag aggtgaaaaa 540
 gctgaacgtg tgcccantha atcttcaaaa aggcagaaac atatcacctt ntgcccccnt 600
 aaacttggtc tttttccgaa ggggaaaaaa aaaatggaaa 640

<210> 141
 <211> 127
 <212> DNA
 <213> Homo sapien

<400> 141
 aaaaatcaca cactgacaac acagaaatac gaaatgctag gaaaagtcta gcatatgaag 60
 gaaaaacatg tcttatgcac tctaataata ttttttcaat tagtataaag gcaaagtcgg 120
 ttttttt 127

<210> 142
 <211> 126
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(126)
 <223> n = A,T,C or G

<400> 142
 aaatatcctc tggatgcntt caagtaatac taatcatttc atgnngnaaaa gtcttttaat 60
 aaacaaattc agagtaaaat taattgaaat atttataata catttggtac acagttattt 120
 ccaata 126

<210> 143
 <211> 730
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(730)
 <223> n = A,T,C or G

<400> 143

gcaagttctg	gagtgttcac	ttctgagcct	gaattccctc	ccctgcaaaa	tgggggaata	60
ccctcctcag	agggtccttg	cgagggtgag	gggagatcag	catggcaggt	gtgctgggca	120
cggcagggcc	tgggaagggc	agatcctttc	cccatccctg	ccacaaacaa	cccaaaccct	180
taaaggagag	caatggcctt	gtgtcaaaaa	caaaaacaaa	acaaaaccct	gtcctaggag	240
actggggccc	taatttctaa	tagcaagcct	ttatgagtc	ctaactctt	actgggctga	300
gtatctcaca	cgccagagga	taacctgcct	tctgtccacc	accaccccg	agtagttgtc	360
attgtgtcca	tttcacagat	gaggcaaaag	ctcagaagag	tcatgtgtta	aaccagcttc	420
tagagcccat	gcaggagctg	cagggtgggga	gaatcacctc	taggtgctct	tcccatggaa	480
tcctcacctc	ccttgagtgg	tactcactc	anctttccaa	tgggtgtgtg	acctttgacc	540
agctttcttt	ccttntctgg	gcctcagttt	cccaccttgg	acaaagtaag	aggtctcttg	600
ggnttcangg	tagttcttcc	taacttcttt	tccttttcat	ttgagcatcc	ttcttcattt	660
tttgccacct	ctcttgtcat	tacangcttt	taccttcggc	cgcgaccac	gcttaagggc	720
naaatttcca						730

<210> 144
 <211> 485
 <212> DNA
 <213> Homo sapien

<400> 144

ctggtcagaa	atgattctct	tgtgacacca	tgcgcacaac	aggctcgggt	ctgtcctccc	60
catatgttac	ctgaagatgg	agctaccttt	cctctgtgtg	gcattttgtc	gcttatccag	120
tcttctactc	gtagggcata	ccagcagatc	ttggatgtgc	tggatgaaaa	tcacctgtgt	180
tgcgtgggtg	gtctgtctgc	gccacttcta	atcctcatca	tgacaacgtc	aggtatggca	240
tttcaaatat	agatacaacc	attgaaggaa	cgtcagatga	cctgactgtt	gtagatgcag	300
cttactaag	acgacagata	atcaaaactaa	atagacgtct	gcaacttctg	gaagaggaga	360
acaaagaacg	tgctaaaaga	gaaatgggtca	tgtattcaat	tactgtagct	ttctggctgc	420
ttaatagctg	gctctgggtt	cgccgctaga	ggtaacatca	gccctcaaaa	atattgtctc	480
aacag						485

<210> 145
 <211> 465
 <212> DNA
 <213> Homo sapien

<400> 145

ccaagacagc	tcgtttctgg	agagtatgag	gggtgtgttt	cttattgtga	aaggaactac	60
cttctcttag	agggtaggaa	gaatgtgggtg	tgtgtgtgtc	tcataaagca	accggacatt	120
atagggtccc	aggtcatcta	taaaaacgat	ccttgggctg	tgtaaaaatg	aagtggcttt	180
tcagtatcct	ctttcacact	tgctgcttcg	ggagactatg	caatgatggg	aagggtgattg	240
cccctttatt	tcattcagtg	ccatgggtccc	tgttgttgta	gtaatttatt	tgtttagttc	300
atTTTTTTTT	tcttaacagt	caaggggaag	agtgattcct	cacactgctt	tcaagctgga	360
ctgagccagt	ctcattctgg	gaaagaaatg	ctgtgtccag	aactcagcag	ctccatctat	420
tttttccagt	cgaaagaaac	tgatcttttag	gcagttttta	cttgg		465

<210> 146
 <211> 351
 <212> DNA
 <213> Homo sapien

<400> 146
 ccagccgggg taatctgtat gtggcggact tgagctacga cgtgggaggc aagtgcctgt 60
 ttgaccagat cagcggcgtg aagcttatgc caactcatcg ttgataaat ccgaggatca 120
 gttcaagacg tcgcagcggg tgatttttggg aacgtcgttt tcggtcagta aattgtgggt 180
 agcgacggag tggttgatcg gcaagaatga tccgtatatt ggcgaggagca gctataccga 240
 gagcctgggg gctgggggga gtaaccagtg ggagaatcag ttatatatga acattgggta 300
 ctactttctga cttaagatct ccagcgtttt aactggcctt atcgcaggca a 351

<210> 147
 <211> 654
 <212> DNA
 <213> Homo sapien

<400> 147
 acttattttt aattactgaa tatttcttag acgttttggg acagatttta tgtaatcttt 60
 ataagtatga tttctgaaga aaagcaaatg cattagtagt tttgccttaa acttgtagac 120
 taaaccaagt attgtaaaat aaacagcgat aacagtgata gtttttaact ctatggatcat 180
 tgtatcactc tggaaaaatgt ggagtagctg taataaatct actcctgtat tatgctttac 240
 agtgcagggtc ttagtttttc ttttttctca tttcttttga aatggcatct cgaacaaagt 300
 ccaccaatcc ctttacaaaa gaatgaactg ctctctctgtg tgtacttcat agaagggtgga 360
 atcggacaga ggcagggttag tgacagttat tcctgaaata caggagcaga gtacagtctg 420
 ttgtgggttc ccggattccg cgcctagctc agccaattaa gcatgagaca taggccattg 480
 agccacttag tagttatgag agtggataga ttggtagtga agagggaaaag aggtctgctg 540
 taaagaacaa cacttggttg tctgtgggga aagaaaagca gaatcttgag atgaaagtgt 600
 gcatacaaat aggatactat cgccagtagg ttatattaca aaacatttat cggg 654

<210> 148
 <211> 539
 <212> DNA
 <213> Homo sapien

<400> 148
 tgaatatcat gagggtgatt ttcacctgat tgcaaaactg ccatagtttg aaacactttt 60
 tcaattttacc agacacactc tgtcaagact tcatatactt ccaacttgca agcctgtggt 120
 ttgccttctc caacctaaaa aggaaaagct ttaaagcatg aacttacatt ctattaaacc 180
 atcagacttg agcttatcca tctgttttag gtgaatgtac aaaccaggta catttccacc 240
 aaacacatag aaaaatcttg tgcatacacag ttcagctaag gtagtagga caatccttac 300
 aatcctcctt ggattttctt ttttaagatgt caaagaagca ggtaagcaac attgttcatt 360
 tgttactggg tgttcttagat caaaccttca caagctatat atatagcttc atatgctata 420
 gcttacaaat ggggtaacaa agtaaaagaa aagaacaaat tatactttga cactttatag 480
 tcaaagtata attaaaaaag aaatcctaca gtgggtaatg gagaaataga taatttttc 539

<210> 149
 <211> 273
 <212> DNA
 <213> Homo sapien

<400> 149
 tttttgggtca ttctcctcaa ggagccgctg gatagtagtc ttgattgact tccaccttgc 60
 cctcatata gtccggtact aaggccaccg acatcccgag gaacctccgg aaccacgacc 120
 gccaaagcaac tcgaccacg atagggtggg cctacgctct cgaagttagt tggatgctcc 180
 cgcctacagg gcgggggtaca gaaggagcgt catttgtgac tggacgcgca agagctatac 240
 tcagcagctt tcctctgtcc cagcccctag aac 273

<210> 150

<211> 200
 <212> DNA
 <213> Homo sapien

<400> 150
 gtttttacta ccgtatggcc cattttaaag ggatgtgtac gccttacact ataaccctta 60
 aaccacctag aaatatgaaa ctcaaactgc cactgacctc cctcaccaag ctccataaaa 120
 gtaaaaaatt ataacaaacc ttattaacca aactgaacga acatatgggc gattgattca 180
 ttgccccac aatcctaggg 200

<210> 151
 <211> 515
 <212> DNA
 <213> Homo sapien

<400> 151
 ctgtagcgat ctttaagaat attttatata tgaaatctgg atttaggggtt cccatgggtct 60
 ggcaccactg ggtacagtag ttctacatgg cagtaattca ttggagttga agcagtgagg 120
 aaagagtcaa gtactagtct tttatcctca gtgtccagtg actgtcaaga gaaatgggac 180
 tgctttctgc attgggatat gtgggttaaa gagtagtcca atatagaaga gtgagaaaagt 240
 gmacctctctg aggcatagta atgttttatt kraaaacatc tcacatgtat tgaatactta 300
 sataggatgt attctgtatt actgaatttt ccagattatt gaagcaatca cctttctgtg 360
 tttaaagtgt tagaagaat gcttttaaaa atgcttaaca taagataagc ctgttttcat 420
 ggtgcaaggt cctttctatg aacatgaatc actggactct gaggggttggg ctaagatcac 480
 atctacatcc cttttaaatg actagtgtgc tcaga 515

<210> 152
 <211> 243
 <212> DNA
 <213> Homo sapien

<400> 152
 atttcaacaa catacttgtc gaggtagtta taaatcttct tagggggagg tgggtggtttc 60
 tggttgaatg ccaattttac agcttctgct gctgattcag gttctttaat tatgcttttc 120
 tttgagtctg cttcagatag cacaacaaaa aaatgatgac acttttcaca cttgacaaaa 180
 cgggtggatg atacaaaagg tctctacatg tgtgcacaag tcgccacatt taggacagcg 240
 cag 243

<210> 153
 <211> 620
 <212> DNA
 <213> Homo sapien

<400> 153
 ttgtcttctc taccttacca tagccagttg ctttcatttt aaaccagagc aagtaacata 60
 ttagtgactt gaatcttcat aagttaaagt aaaaaacagc aaaaaaccta gatctttgtc 120
 ttttagaaca cagaccattt tcaggaaaagc agttagctaa gtgtttaatt catgaatatt 180
 gtatactgca tccccacca caatttacac aatcctgtgg atagtctac ctccacctgg 240
 tcaacctaca tgatccttaa gctaattggc gatcacgatg accttgtaga catgcacaca 300
 actatacctt tgtccaacag atcataatat atctgtctat caactggttt tacctgccta 360
 atcctactga tttgggcact gcttgtatag tctctcaagt tcacaggaaa tgttgatttt 420
 ctaaggctct cattttttaca gagtatacag gcaaagtgac aggggaaaag gaattagtct 480
 aagagtaagg ggatgattat tatattgagg ctaaaaccac aaagtggctc aggcttttaa 540
 aaaaaacact gtggataatg acaaaaagca taagtaaaaa tatttttgaga aaaataaagt 600
 acaagttttg aacaccccc 620

<210> 154
 <211> 843
 <212> DNA
 <213> Homo sapien

<400> 154
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 tttttgttaa cagtcttaat aaataataaa atggaataaa gaaacaaaaa aaaaaagaaa 120
 aagtttgtat gaaaattcat ccctatttct ttattttgga ctaagtagtc aaatttctac 180
 tatattaata ttatgtaagc gacacccatt taaattcact ctctttgata gaaagggtgag 240
 ttgattatca cacctgctat tttttcactg ccaaaragac tgcaataacc tccctccatc 300
 accctcaaaa aacaaacaga aaccatctga ggcatagcca ttgtttacat attgtgtttg 360
 tgtgcaccta tctacaacgt tctttcttct aaggagttaa tctgccaata ttttcggctt 420
 cagcagcagc gctcttcttg acagactaag agaaggatct acagaaaagt catctgatta 480
 aggttttggg tcaaaattaa actctctgga cagaatcctc tttccttcac ttggatttct 540
 gcaaacagaa agcagattat tctcctggca caatagcgac tctagaaacg cttatgtttt 600
 tcagactttg gcagaacttg ttaagaacag catcatcata atacatttgt acaaactcga 660
 atttcagtgg ctcttttgtc ccacatgatg catgatgaaa tttataaagg tctgttttac 720
 cccacacaggg tcatttcttt tgtgttecta cagagccaat aggttctatt taagtccaag 780
 ttattatatt aaccatccct ttcactagac tagagaactt ctttttcatg gtccatatcg 840
 tga 843

<210> 155
 <211> 674
 <212> DNA
 <213> Homo sapien

<400> 155
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 caattcatat cccttaggga aaaaagagga tcaattcact actcaatatt taatacagcc 120
 aaaatgagct gccaaaaaaa gcacacacac aaatactgtg aacagaaaaa tacaagaaaa 180
 tgactaagct gggagtcttg acggggtatg gacattgctt aaagcactta tcagtcccca 240
 gaaaaaccaa accaaaaaca ttttttacga tggcatggcc tcatggcccc ctttaaaact 300
 gttgatggta acaaaaggga gggggtgggg agagaaaaca caatcactgc tccctttttg 360
 ctgcgccagt tgactgcacc cctcacggca cggcatgta cacaactacc acacaaggag 420
 gaccaagtcc ctctgctggg ggctccttaa aaggcaaggc ttgagttttg gctgatgagc 480
 aagttctctc cgttaccaat ccctgccaac cagcactacc atggctgaat tgatctaccg 540
 ttttcctgag taaactgtaa ctggctacag tttcggtaac atggaaaaga actcagctac 600
 tacagccaac tgcaataact caggaacccc ctccatccct ggggctcttc actcctagtg 660
 catcttgatt ggat 674

<210> 156
 <211> 671
 <212> DNA
 <213> Homo sapien

<400> 156
 ccttttagtga acacctttat ctccatgtcc ctcttagagc ccagagagct gcccataggc 60
 attttccaga attcctcatg tcacctagt caatttccat taactcagat cagccattgt 120
 gattcaccat ttgtcaggct ctgaggttta aaaaaaccta ctatcaccat catccttcaa 180
 cagccacagt ctgaattgag ccaacatttt tttttctttg agaaagaagt gggctggggc 240
 acaactttta gtctgagggg agctagtagt cggcttgaca attaaagcca tccataacaa 300
 cttttcctca aatgtgttga ctctcaggg gctaaactgc tcttagctta gaattatgct 360
 ttactagaga tctaccatat aagtgggtta atcactacca tcctgtaact agttatatag 420

cttccagaca	tgagggagac	atcaaacagg	gatggaagca	acccaagga	tatgcaagaa	480
gggcatgatg	aacccccctt	cctctggcag	gagaacaagg	ccaaccaagg	gacagactgg	540
aaagcactta	gatgtttaag	gaggagaaag	gggaagcttt	gaccagtcct	tgccttttgc	600
caagttcagc	cagttctccg	ctgcttgcaa	cctctagcgc	agtaacattt	tgcagaattg	660
cagattttcc	c					671

<210> 157

<211> 474

<212> DNA

<213> Homo sapien

<400> 157

cgcgttcttt	aattctttta	gcctagaaa	tcctttacac	tacttaccta	aagggtcccaa	60
agtaaaacac	acactagtag	taaggctagt	gcatttcctt	tctagcactc	aaagaaagct	120
taacattttt	gacagtttgc	aaataccgcc	ttgtatttct	gattcagcct	tattcaaagt	180
atcataataa	aatattttatt	aaatstatgt	tgatctgcgt	gcattttatga	tctccagatt	240
aacgttaggc	ttctctgttg	ggccctaact	tggaggtgct	tttttggatc	cctcctcccg	300
tgattcattg	taatttcatt	tcccttgcca	tggctctgac	cagagaagat	tctaaatata	360
tgccccaaaa	gccaaaatta	tatcttttga	aaagtgaat	gaagagttga	gtcastaatt	420
tatttttagat	attactgcct	aaaacaattc	cccaaaattt	atggaagttg	gagg	474

<210> 158

<211> 584

<212> DNA

<213> Homo sapien

<400> 158

ttggattctg	cagttccaca	tcattcactc	cggcaaagga	gagaacttgt	aacaaagatg	60
agtgccaaagt	ttagtcaatt	taccctacct	ggaatactat	atacaactct	gggtctcatg	120
tgtgttaaaa	tacatacagt	gaagctgagg	aagagccact	gaagtaaaaa	gtattgttta	180
caagttggaa	aggatgtaaa	aataatctaa	agtatactaa	gtcaggaata	aaaggcagag	240
ttaataaaaat	tgtggctggg	actgatagac	gaaacagata	tattttctaa	atcctggaat	300
aattattaaa	aaattttaca	tgtatcaatg	gattccagac	tccatatttt	aagtttcaca	360
actactgtca	tttaaaacta	taccttattg	aacgtctccc	actctcaata	aattacccca	420
aatcactctt	ctccaaaacg	taaatttggg	acacactgac	ttacaaaattt	tgggcttaat	480
ttataggatg	ttgtggccct	caaaaatatc	attgtgggct	aaacaaaata	aattcttgaa	540
acaattctaa	aatcaatca	ttgtccaaaa	tgaacttttt	ctaa		584

<210> 159

<211> 671

<212> DNA

<213> Homo sapien

<400> 159

cctaatttta	ttacttttct	tgccactgct	attattgata	gaaatacaat	taaataatta	60
agatgaacca	atccattgga	agattactaa	aattgtatct	tcccaatgcc	tcctacagta	120
agatttcttt	ataattataa	cccttggaga	caatttgaac	tttattttaa	tggtctgctc	180
aaatctaaat	ttccttctcc	taggctgaag	cctgatctaa	ataaggaagt	agttgggata	240
tatccacagg	ctgtcgaaca	tggagctgca	tctgagagac	aggtggcagc	aacccaaagc	300
aaagcaggga	ctgagaacag	gcaggttcca	agagcaaaat	ggaacttgaa	agccaagtat	360
ggttcactgt	aaaggagaaa	atatagaaat	acggaactag	aacacctggg	ctgggatgtg	420
gtaagcacc	aaaatatagg	aaaactgtat	gaattcttgt	gaagcagtaa	actatgatag	480
taatcatgtg	acacatatga	taacaaactc	aaaacaggga	aaagaggggc	tttattcaat	540
gctggagata	agtgaaaaaa	aaagtgaagt	gtctcaagga	cagaagttat	catctcaaaa	600
aggcatatca	gctagatctc	gcggaaacca	tatgattatc	ataattctag	actctgttgc	660

gtattacaaa g

671

<210> 160

<211> 315

<212> DNA

<213> Homo sapien

<400> 160

ccagagaggg	agggctctgc	ttcaccacag	ggcaccagaa	gaggactggg	gcgcgggaag	60
accaggtaat	cataatgcta	ttaaaaatag	cagtaatcat	actgttttat	acattgtata	120
atgtcataag	gattttaact	ttcatgtaac	ataattgctg	taaaagtttc	cccagtttgt	180
tttgtgctat	ttaccctggg	gttaaaatgt	gtaagaattt	acattttagg	tatgttaggt	240
ttattccttt	ttatatgggt	tctgtttgaa	attttgattt	tagaagacat	tcattctcaa	300
ggtcataaaa	cacac					315

<210> 161

<211> 607

<212> DNA

<213> Homo sapien

<400> 161

tttytggtgc	accttggata	attgcttaac	ttttaaaatt	tacgttccct	catttccaaa	60
aagggtattat	aactcactgt	tattttgata	attgagataa	atgtacgtac	aagtgccttg	120
aaactgtaaa	gtgcattata	aacagagggg	tttaccatag	aggttctacc	ttgatgtatc	180
aagagaagcc	ttttctggaa	tctgggtcag	ccttgtgaga	tgctgttagg	taaggggact	240
ccttggtaga	atttcttaca	tttgtgtaaa	aagttctggg	tcctgagtaa	ttccaaagaa	300
gatgctatga	ggagttcact	gtgcctttga	tttgatccca	atgggtcaga	atatgttttc	360
tcattcagta	ggctactaca	ggatttgaag	tagaaaaaac	aggggtccagt	gaccttcacg	420
ggatcctaga	tgttcatgaa	tttcaatcat	ttgagattgt	gggggtgtgg	ccaatgctgc	480
tctcaaaaag	atgttgccct	tcttcasaga	gcattaataa	ctaaaaaatc	ccctgggtccc	540
aaattttattg	tgtgtmtctg	aaggctttaa	ctgaagaaat	gaaawgcaca	ctcatggaac	600
aaactaa						607

<210> 162

<211> 443

<212> DNA

<213> Homo sapien

<400> 162

tgagttttga	aaaagtgaat	aatcaaaagg	aaaataattc	cttgttggtc	ataaattaag	60
catcactaaa	gtctcttgaa	aggcatttct	gtattgggca	agatttaaaa	tactaaagcc	120
ttaggtccta	ttcatattta	aagtagcatg	tttgtaacct	gttactatct	ggagagagaa	180
gcagttgcct	gccacaattg	aagactacct	ttcaaatagc	aaaagagaga	gagaaggctg	240
atatttcggg	cttttaaata	aagattttgt	tggttctgct	tttactgtaa	ctgtcacttt	300
cccagtgaag	atgattttcat	atacatttga	gggtcttaca	sgtatgggta	aagttctata	360
aattgcaaca	aaatgatacc	caattttcatt	ttatcctttt	tgtattgtga	aactggaaac	420
tttatgacat	tgtaaattat	cag				443

<210> 163

<211> 686

<212> DNA

<213> Homo sapien

<400> 163

caggcaaatt	atagtcaaat	acatcacccc	cctcaggcat	ctgtggcaag	gcacccctct	60
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agagaacaac	taattgatta	cttgatgctg	aaagtggccc	accagcctcc	atatacacag	120
ccccattggt	ctcctagaca	aggccatgaa	ctggcaaaac	aagagattcg	agtgaggggt	180
gaaaaggatc	ccagaacttg	gatttagcat	atcaggtggg	gtcgggggta	gaggaaaccc	240
attcagacct	gatgatgatg	taagttagct	ttgtatatct	ttgaaacacc	tataaagttt	300
tatttaccga	ttgaataact	aaatgtaagt	gaaaatctaa	tagatgttta	tgtaaatcta	360
ggtagacatc	acctggattc	cccactctat	tgcttacctt	tttgttttgt	aatttgatca	420
gttcaagtta	aaacaattta	acaaaaaact	atgaatgttt	atgatataat	gaaatgattg	480
ttaactttct	tattgctttt	tcacacacct	ataaaagtaa	ttttattact	cccaagagaa	540
atcactaaag	gcagaattac	tagaggtaaa	aataactagg	gttgggtacag	tattactcag	600
gagaagtcaa	ggggagaaaa	cttgtcccaa	tgattcaaaa	taattttggc	atgggggggg	660
ggagggaaaa	aaatttggtc	tccttt				686

<210> 164

<211> 706

<212> DNA

<213> Homo sapien

<400> 164

ttttttttgt	ttcatttgct	gcttaaaata	aaaattataa	attagattta	aatggagcac	60
taattataaa	acagattgca	agtaccacca	tttgaaaaaa	aaaaaaaaaa	tcagtggatt	120
tccataacac	agaaaatgca	tgacatgca	tctacagtag	agttaaaaat	ttcctgtgac	180
taaaaaatta	aaaactggaa	tcaccagtag	caaagtata	gtcaatggct	atgacaagaa	240
cagatcctgc	cgagctcata	aatgcaatta	ttggcttttt	tgctttataa	aaaagacatt	300
acataattta	ttgcattatt	ctcctaataa	aaaacatact	accacgtagc	tctccccatc	360
cccattcttt	gcttccagat	ttttatagaa	aataactgtt	ttagtctggc	cttggaaagt	420
gaaccaccca	gcaccacctt	cacctactca	ctcttcaatt	caatatgcac	atagcaaaaag	480
ccaacacttc	aaatctcttg	cccacatcaa	aaaaagtagt	ttcaggagaa	aaacattaat	540
accagttgaa	taaaaaataag	ggcataaaaag	ctatgagaga	gatagctctg	ccatctgtct	600
ctgggctaaa	aatcaaggct	aactattgcc	tttggcacca	caagggtcaa	ggtccatggt	660
tttattagaa	aagtccccac	aaaaaaatta	aacccccctc	acccca		706

<210> 165

<211> 427

<212> DNA

<213> Homo sapien

<400> 165

tyywgggcaa	ttaggcagga	gaaggaaata	aagggtattc	aattaggaaa	agaggaagtc	60
aaattgtccc	tgtttgaga	cgacatgatt	gtatatctag	aaaaccccat	tgtctcagcc	120
caaaatctcc	ttaagctgat	aagcaacttc	agcaamgtct	caggatacaa	aatcaatgta	180
caaaaatcac	aagcattctt	atacaccaat	aacagacaaa	cagagagcca	aatcatgag	240
tgaactccca	ttcacaactg	cttcaaagag	aataaaaatac	ctaggaatcc	aacttacaag	300
ggatgtgaag	gacctcttca	aggagaacta	caaaccactg	ctcaaggaaa	taaaagagga	360
tacaaacaaa	tggaagaaca	ttccatgctc	atgggtagga	agaatcaata	tggtgaaaat	420
ggaaaaa						427

<210> 166

<211> 124

<212> DNA

<213> Homo sapien

<400> 166

accatgtttt	cgttgtgtgt	gagcagggaa	gggaactttc	ctgccttatt	taaacctggg	60
ccgaggattc	gtggaatctg	cttgatcaga	gactctgagg	ccaaaaacgc	atcatacttc	120
ttgg						124

<210> 167
 <211> 232
 <212> DNA
 <213> Homo sapien

<400> 167
 tctgcatagc aaatatgatt taagaattta acatcattat ttgatcacia gcgtaaatat 60
 gtcaccataa ataaatgtaa attcattgta caaaaattcc caacaactct taatacaaat 120
 atgggtacatt tgacagtttc tgaaacagat tattttttaa acttttttaa acctaagctt 180
 tatttttttc ctggttatta gacacacaca aaaaaataa aaagaggctg gg 232

<210> 168
 <211> 677
 <212> DNA
 <213> Homo sapien

<400> 168
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 atgcatttgc caccttattg cattttttaa atctttattc tatagtgaat tggatttccc 120
 aatctgccta agcaaaggca tgcccttcta acaagatttg cttagagcag aggtgataga 180
 aggaagaatc cgaagaccct ctggcatggc aatctgggag cagcacattg ttgatggagt 240
 ccaagtgcac acatttcaca caattcattt agtgacaagt gggcttgctc ccttttcac 300
 caggaaaaaa actactcaca gaccactgcc cagaatctgg aataagaacc ctcatattta 360
 ggtattcttc ccaacaaata aatatctaaa tattgaaagg gggcatatca gaaaacttaa 420
 aagacacaaat aaccaaaaacc aaaaccctct tcaaaacaag taagcaatgt ctgtatttag 480
 ttcactctaa aacattctta gcttttcttg cagtttggtc ctaaaagatt tgattgggca 540
 caagaggaac gaaattatta ataaaaataa agcttatttt tgtttttgct gtggataatc 600
 ggtacaaaaac gtttccagat ctgagactta aatggatctt ttaaggtgaa aaggagaatg 660
 ccagggttcta ctgaaat 677

<210> 169
 <211> 635
 <212> DNA
 <213> Homo sapien

<400> 169
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 gacgcacatt tttgtactgg cacatattct tagacgacca attatagttt atggagtaaa 120
 atattacaag agtttccggg gagaaacttt aggatatact cggtttcaag gtgtttatct 180
 gcctttgttg tgggaacaga gtttttgttg gaaaagtccg attgctctgg gttatacgag 240
 gggccacttc tctgcttttg ttgccatgga aaatgatggc tatggcaacc gaggtgctgg 300
 tgctaatactc aataccgatg atgatgtcac catcacattt ttgcctctgg ttgacagtga 360
 aaggaagcta ctccatgtgc acttcctttc tgctcaggag ctaggtaatg aggaacagca 420
 agaaaaactg ctccagggagt ggctggactg ctgtgtgacg gaggggggag ttctgggtgc 480
 catgcagaaa gagttctcgg cgggcgaaat caccctctgg tcaactcacat ggtacaaaaa 540
 tggctttgac ccgctaccga cagatccggc cgggtacatc cctgtctgat ggagaggaag 600
 atgaggatga tgaagatgaa tgaaaaaaaa aaaaa 635

<210> 170
 <211> 533
 <212> DNA
 <213> Homo sapien

<400> 170

ctgtgatctc	acaagtgtga	aaaatcttat	gaatgtaaaa	tgtgtggaga	ttcttctttg	60
tttttagctt	ccactttggg	aacatgtcaa	agcacacatt	gagaagtccc	atgagtga	120
gagatgttgg	aaagcccttg	aacttggtcg	ttaggaaaca	tccacactga	agaggaacct	180
gactgtatgg	aaggtcaaaa	aggctgtatt	aattttacatg	caaaaagtca	cactagagga	240
atgccatata	agaatgcttt	tggtaaata	acatgtttta	aagaggttat	atatcattaa	300
taaaaatata	tagctgggtct	gaagaccctg	agttatctca	attgttcacg	gttacagatg	360
gaactcttta	ttattgagga	gttccactct	ttccccatt	tgtcactact	acacttcctt	420
agtctttaaa	acaatttttag	gctgggtgca	gtgggtcatt	cctgtaatcc	cagcactttg	480
aaaggccgaa	gcgagtggat	catttgaggt	caggagtctg	agaccagcct	gga	533

<210> 171

<211> 568

<212> DNA

<213> Homo sapien

<400> 171

cccttgsc	aa	actttccctt	aagtattgca	ctacaagtct	aagacacttt	tcactcaaag	60
ttccttcctt	ccttacctct	cttttaactt	ggagtcagac	tttcatcagt	ctgacaactt		120
ctccctgtct	ccttcctttt	cccccttca	caagcatttc	acctaacaaa	tttcttatgt		180
gcttaatccc	ctcttagaag	cagatgccaa	gatgggatta	agcacataag	aggctcctgga		240
ctaatacaat	gacaaaggct	ccccctgaag	catcacacta	aaaggaaaaa	aaaaaaaaaa		300
acctagccat	tttacattaa	ctatttctaa	aatatagtat	ttgcttccct	atttgctaaa		360
acaaaatata	ctaaacatga	ctattccaaa	aatctgtagg	gtactaagaa	tatgaagaga		420
ttcactctac	ttcaggggat	ggagttgtag	tagaaaaggc	tttgtggagg	gaggggtggtg		480
tttgaaatgt	actttaaaag	ccatcctcaa	agcctcgagg	gctatacctg	gcctggtgat		540
tatccaagga	cagtccattc	aaacaggg					568

<210> 172

<211> 167

<212> DNA

<213> Homo sapien

<400> 172

ccattttacag	gaatcagcca	cttcagttca	gacagcttta	ttaaaccgcc	tggagcgaat	60
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gaggcatttg	ctggaaacaa	gcactttgcc	aataaaaaacg	agagagg		167

<210> 173

<211> 391

<212> DNA

<213> Homo sapien

<400> 173

cctcccaaag	tgctgggatt	acaggcatga	mccmccmcgc	cctgatgata	gacacgtttt	60
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ttaamcaatt	agagatat	gttcattacc	acattttggg	agtcattatt	tcctctatga	180
agagagaaaag	gaatttgata	caagttcaca	ggggcttcca	gtagattgag	acttttat	240
ctagctgagc	tgctgatgta	tgaatttttt	ttgktattat	gactttcata	tgtattaaaa	300
ataaaatgaa	aaaacaaggg	attaggtgag	gaacctatac	gtctctaata	tgcaaaatac	360
cacagaaata	atgactgktg	ggaaaattag	g			391

<210> 174

<211> 474

<212> DNA

<213> Homo sapien

<400> 174

gaactcagag	agaggattgt	cacccttggc	atctgagctg	acactataag	gacaatgagg	60
agtctccttg	gggatatag	gggagatgga	aggacgatgc	ctgtcctacg	gggtcttggg	120
aggtttaggga	tacacactgt	gagctgccac	aggctcaaca	gtacggatag	ggggtgctgg	180
aaccagccag	ggctctgatc	accaagctat	gtgccccatg	cagaggaagg	ggtagtggca	240
cactgaacca	cccagccaca	aggctatctc	cccatacagg	gcacctttaa	aaaaattatc	300
cttacagggg	aagacgggga	ggaaggatga	actgtgtgcg	gtgatgttgc	agtgagtgtg	360
agtttgtgtc	cgtccgcttg	tatgaggggc	taccttttac	taactagccc	ccaactttca	420
ttatctcccc	tttttctgtc	tacccttctg	ccttttttaa	gtggcttgca	atcc	474

<210> 175

<211> 655

<212> DNA

<213> Homo sapien

<400> 175

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gcaacatgta	cccacaaatg	ttccaggagg	taaataaaaa	atacaattca	gcctcttcta	120
aaccatcctt	gttgatatct	ctgtacttct	cgaaagttaa	ttcgttatct	ggactccata	180
atcttttcta	ttaattcacc	ctatgtccaa	ctccaacagt	gaaaaaaatt	tatttaattct	240
ttgcaataag	cctataggca	ggcagcatta	tcctcagtct	gcagataagc	taaggctcag	300
agaagcttgt	atactgtcac	ttaggtagta	attgcaagag	ctggcattca	gaccagact	360
gtgggactcc	tcactccatt	ctctttcccc	ccactaggct	gtcctttaa	atacaatgga	420
tgcttgatga	acgcttgtgg	gaatcctggg	tggacacagt	tccttttcgg	ccaaaagcac	480
cttgacgact	tgtgaagaat	taatctggaa	aacttaacct	atctataaaa	acgtgttatt	540
aagggcagg	tattcccacc	ccctttacca	aagaaaccgg	ccctgacctt	tttttactgg	600
gggttgggtct	tgggcatttt	caacaagggg	ggaacagttt	aaaaattccc	ccctt	655

<210> 176

<211> 660

<212> DNA

<213> Homo sapien

<400> 176

cctgggtcaaa	gtgggcatta	ccattcaagc	attactagac	atcacccgta	cgaaggctct	60
gttcacatga	aactaccctt	tctccattgg	gggctcagac	tctgctctca	tccaggatcc	120
tgaactctgc	tccaggcacc	tgttcaaccc	tctctcccac	ccactgcctg	tcacttcaact	180
gactccagtt	acattgaaac	aattttcagt	ctaaggagg	atcttctacc	tttcagagct	240
gacctccgac	tttaagactt	gacaggtatt	tatcttgaaa	ccagagaggg	agctggagga	300
aaaaaaaaact	gagcaagcac	atcaatgcct	tttccacctt	tcttcacctt	ttccacactc	360
accgactgcc	attaccaaaa	cgccaagcac	aaccggtttg	gaacaagacg	cattccgttt	420
taattaaaa	caactcatta	tgtatttttag	tgggggggaa	gggggggcaca	atcagggttt	480
tcaccaccaa	atctttccaca	cggtttctga	acaccattgc	cttttaaaaa	actatctttc	540
cacctccaaa	atattttattt	aaattttatt	tattacggag	gtgggtattct	tcctttggga	600
gccaaattgg	gaaatttttag	gaaccttttt	tattaccggg	ttttttgggc	gggtaaacct	660

<210> 177

<211> 459

<212> DNA

<213> Homo sapien

<400> 177

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tgatctaatt	tccctgttca	cacaaacttt	actctttaat	ctgatgattg	gatattttat	180
tttagtgaaa	catcatcttg	ttagctaact	ttaaaaaatg	gatgtagaat	gattaaaggt	240
tggtatgatt	tttttttaat	gtatcagytt	gaacctagaa	tattgaatta	aaatgctgkc	300
tcagtatttt	aaaagcaaaa	aagggaatgg	aggaaaattg	catcttagac	catttttata	360
tgcagtgtac	aatttgctgg	gctagaaatg	agataaagat	tattttattt	tgktcatgyc	420
ttgkactttt	ctattaaaa	cattttacga	aaaaaaaa			459

<210> 178

<211> 720

<212> DNA

<213> Homo sapien

<400> 178

ctgcaagctc	ccactccttc	catttatctt	aacgcccagg	ctgacttcta	agctgctttt	60
cactttccta	cctccactgc	attttcgccc	ctgataattt	ttgtaagctt	acctaagcct	120
cccttctttt	gagatcccct	tcttaaaagg	gtccatttcta	ttaaccctac	cccatatcca	180
gttactttta	ctacctgctg	atctatcgct	accttgctcca	attcatggga	attacagggt	240
gcactgggac	aagagtaaaa	tgatccaaca	aacataatgt	tgcatTTaaa	aaaataagct	300
aaaagatact	gatgactttt	tataactaca	acataatcgt	ttgtgaataa	gaacatatat	360
agtaaaaaga	tgaaaatgtg	aacagggttg	ctatttccta	aatttatggc	agaagggtgt	420
tctggagagg	atgggaagaa	aaaatgaagg	ctggcagtga	tgggtgggga	aatgcaacct	480
ccaaaattat	ctatctatat	atttttatta	aaaacaccca	cagtaattat	ggcaaagtgt	540
aatggtttgt	ttgttctaag	gttttgata	catttaagat	ctcttgcttt	ctgggtacca	600
tttcttttct	tttcttttct	tttttttca	aattaattcc	aaaagactta	tatctgctac	660
atgaagaacg	aagcaagttc	agctctcttg	gctgaaatgt	tcaaagtctt	gagggcaagg	720

<210> 179

<211> 427

<212> DNA

<213> Homo sapien

<400> 179

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ttgtaagttt	tctagtttat	gcacataaac	gtgttcatag	tagccttgaa	taatcttttg	180
tattttctgtg	atatcagttg	taatatctcc	catttcattt	ctaattgagc	ttatttgaaa	240
cttctctctt	cttggttaat	cttgctaagt	gtctatcagt	tttattttatc	ttttcaaaga	300
accagctttt	tgtttcattt	atcttttgta	ttgtttttgt	ttgtctcaat	ttcattttagt	360
tctgctctga	tcttcgttat	ttcttttctt	ctcctggggt	tgggtttaga	ttgttcttgg	420
tttctctt						427

<210> 180

<211> 728

<212> DNA

<213> Homo sapien

<400> 180

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tcatgcacta	gtgcatgtat	gcattttttac	attttttaaa	ttacaaaaat	caacctatta	120
taactgctta	gatatatatg	aagtaaaaaat	gaaagttctc	cctttacatg	acccatcccc	180
catcattttc	ctcttttatct	tatactgtca	gcattcccag	cttgtagcac	agtgtctggc	240
aatagtaaat	cctcaaaaaa	tgatcaatga	ataatttaat	aatgattaat	aaataaatta	300
atgatgatgg	tgaagataaa	ttttagcatt	tattgaacgc	taactacaaa	ccagggagtg	360
tggtaaatat	tttataaaaa	tcaatgaatg	agctaaaaatg	ccattctatt	attttttttg	420
atacggttta	atatttttact	cataaatatg	cttaaagaat	attataatta	tatgacttag	480

aatggtaaaa	caatatgtac	agcagtatcc	tatttttttag	aataaaaata	taaatatgtg	540
ctcacatatg	tgggtggggc	atgcctagaa	acccgattag	aacgggattt	tttcttacca	600
ccattttttt	tacctgggaa	aaatatggga	aaattttatt	tcccttcttt	ttggttctaa	660
aatttatata	caggagccta	tttggctttg	gataaatcat	tttaaaaaag	gtggtttaaa	720
aaaaaaaa						728

<210> 181
 <211> 546
 <212> DNA
 <213> Homo sapien

<400> 181						
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tgagcttgcc	aagtaggata	tattgcctgg	actaaaattt	atttcctaata	cttctgatga	120
ccaagaaagg	aaaaattaag	tttgcagatg	ggagatgaaa	tatagccagc	gaatatgcat	180
actggttctg	aatgaaagga	attaactttt	cagtcaagaa	acagtctgca	tgccgtaaat	240
tgaatttttc	ctgcaactgg	aatgattggg	taattctttt	tgaacactgg	cctttctccc	300
caagaacact	aatgaattgc	taatattttt	taaagaaaac	tggtttttta	attaggtaag	360
ctccacttcc	tcttattttt	taatccctaa	agaaaactgt	taaaagggaa	tggatctatc	420
acgccttttc	ttttaaaacc	acctttttta	aaaaggattt	ttccaacccc	caatttgctc	480
ttatttttaaa	attttgaacg	ccaaaagaag	ggaaataaaa	atttttccct	taattttacc	540
ccctta						546

<210> 182
 <211> 333
 <212> DNA
 <213> Homo sapien

<400> 182						
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agaggctgga	agagaagtat	gtgggttggt	ggatcaagat	acccaagttt	cagtcttgac	120
actgctatta	cttagtcagg	tgaccactgt	aacttcactc	tgattgagcc	tcagatgtct	180
cacctgcaaa	atggagtgtg	aaatttgcta	tggttgggtg	tcacacggat	taaatgaaat	240
aatgcctgtt	aagcgcctat	ccagcactta	ataagatggc	cactgcatca	taatgctttg	300
ggcacaagta	acacaacatc	caacccaaag	ggg			333

<210> 183
 <211> 393
 <212> DNA
 <213> Homo sapien

<400> 183						
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aagaaaaattc	tttcagcaat	acatgtagag	tcaagtttct	tgcattggata	actgaacatg	120
tgggttatga	gatttttaaaa	aatgtctcgt	gacaaacttt	acggaaatgc	aacaatctgg	180
acatctagtt	ttgtctgaga	gtggcgtgga	tatgaagaac	tgtgctgttg	gtgctgatgc	240
cacactaagt	tttggcagtc	acactcttgg	ttcttcatat	ttgaggagat	gggatggtga	300
ggaggcctgt	tggctttatt	ttattacgtg	ccaccatcta	gaatacagat	tcttggatat	360
ttcatcttca	caaagggtgaa	gctgcaaact	cag			393

<210> 184
 <211> 700
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(700)

<223> n = A,T,C or G

<400> 184

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ccaaattggg	cccntgttkg	ccagataacc	atgattgkkg	athtagaaam	ccccatgwt	120
tcagcccaaa	atctccttaa	gctgattaag	camcttcagt	aaaktctcag	gataaaaaat	180
caatgtgcaa	aawtcacaag	crttcctatm	cgamcaatam	cagmcaaaca	gagccaawtc	240
atgagtgrac	tcttattcac	aattgctagt	aagagaagaa	aatmcctagg	aatacaactt	300
mcaagggatg	tgaaggwtct	cttcaaagaa	gaactacaar	ccrctgctca	aggaaataag	360
agaggmcmca	agtaaaggg	aaaagcattc	tatgctcatg	gataggaaga	atcaatcccc	420
tgaaaatggk	gatactgccc	aaaataat	atagattcaa	tgctatcccc	atcaagctac	480
cattgacttt	cttcmcgga	ttnggaaaa	tctactttac	acttyatagg	gracaaaaaa	540
agaagcccwt	gtagccaaga	caatcctagg	caaaaaagac	caamcctgga	ggcatcacag	600
tmcytgactt	cmaactatwc	taccaaggny	tmcrkgmcc	aaaacagcac	ggkacntggt	660
mccaaaccrg	acwtwtwgac	cmmcagacac	agaacmgagg			700

<210> 185

<211> 192

<212> DNA

<213> Homo sapien

<400> 185

ccagycctttc	ttttaagtaa	gcgctttttc	aagctcattg	tagctacaaa	gtcaataaat	60
tggtctttgt	tattttttacc	tgaaaaggct	gttaaagggt	aaaatgacaa	actcaaattc	120
aaagggattg	gaggatattg	tgtttatgat	ttctcagaac	aacaatctag	agaccaccag	180
ggtgggtttc	ag					192

<210> 186

<211> 688

<212> DNA

<213> Homo sapien

<400> 186

gtgctggaat	tcgcccttag	cgtgggtcgcg	gccgaggtgg	gatattttctt	ctggatagat	60
ttcagatagg	tagttccctc	aaataagatt	atatgggttt	gcatttttcaa	ggcagagttg	120
tatacttcct	gctctttatt	taaataaaaa	aacttgaaaa	tctgttctgc	ccagtattgt	180
aagcgtcag	gtacaaatat	gaatgaaaca	atctctgcct	aagtaacaca	agtataggga	240
caagattctc	agtaaaattc	tcacgtgaaa	tttgtaactc	actagacact	atcaggagat	300
caataattat	gtaattaaaa	aaaataatta	cctgccaaac	tggtttcttc	tttggcactt	360
ctgcttggtt	ttaagacaat	tctcacatag	aagcttatta	ttccccatta	gtcattccat	420
agatgtaaaa	ctggtagaaa	caggacttga	attgaacatt	ctttacaagt	aagttatata	480
gcttctgaaa	aaagggcttg	aaaaagcatt	tttggggact	ataagaacct	tcaaatgctt	540
tcccctctta	acaaacctta	aaattat	gaaaataatt	taagggggct	gattttctct	600
tgtcaaaatc	ttgaacccca	cttaccaggt	ggttgggtcaa	accaaagttc	aaaaaaaaagc	660
ttctggcctt	tcctttatcc	cacttgca				688

<210> 187

<211> 779

<212> DNA

<213> Homo sapien

<400> 187

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gcaaaaaaca gatacatttt cagtgtttta aaatgaacaa gtatggaaag gcttatacag      60
taactgaaaa gtctcctttg ggaagccaag gtgggaggat tgcttgaggt caggagttca      120
agaccagccc aagcaacatg gcgagacccc atctctacaa aaaattaaaa aatcagccag      180
gcatggcgga catacttgta gtagtaacta catgggagggc tgaggcgagg ggatcacttg      240
agtccgagag tttgaggctg cagtgagccg caacgcgccc tgtactccag cctgggcaac      300
agagcaagat gctgctctaa aagaaatfff cttttaaaga aaaaagtctc cctcatagcc      360
tgttctacaa aagtcctatt tcttcccaca aaaagcctct ggtacctggg gttagttctt      420
gggggtggaag attactttta aaaatagaac ttttttttaa gtatatcttt tagggaactt      480
tagttcccga agcttttaga aatgggatct tgaaaacaaa agggatttca atacctatga      540
caatgcttaa agaattattg gggcatttat ttttcaatgg aggggccaca aatctttgga      600
aacccttggc caattaccag aagccacttt aatttttgac cgaaaatgtt tttaaaaatt      660
ggcttttggg aaaactgtct ctttcccaa aaatgaaaac cttgaaaaaa aggggaattt      720
ttaaggttgc cccctcatta aattttaacc cctctgaaag aaaaccctct tgtgacagg      779

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<210> 188

<211> 394

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(394)

<223> n = A,T,C or G

<400> 188

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tgatttgacc ttcacccctt agtttactgg cgtaaaaaaa agtctcagca attttcatta      120
tttctcgtgg gtctcattat caaaccttta cttatttcgg catatttctt ctgggcttct      180
tctagtttct gccttacaag caatgctgtt ctgtaaattt attgaaacct ctggaacatt      240
tcacctttag agatggagga tggaaggatt ggyaccagaa gagggctaag atacgttytc      300
tgtcttnag ctgaaagcac agyctactct ccttcgtttt gycgatgaga aaagttgagg      360
ccagaagggg ggtgacatgt ttagatgcac ccag                                394

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<210> 189

<211> 681

<212> DNA

<213> Homo sapien

<400> 189

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aagttctgac tttggtctat aaaacagggg tattggctgt ggctgcactc aatatctaaa      60
aagttattag gaagtgcctc gttattgtca ttaaagatat ctaaatatgg tagaccaaag      120
gttggtgaga aacacatatt atggactgag ttctgtttct tctgctgtgg cgcacctaa      180
ctcaagcctt ccttctctcc ctccccctt ggccggcatg gtatctgagc tcacagacag      240
acaaggcatg ttagaatcat cagatcatga gcaccgtgct gggatttagc cctctccaaa      300
gtcaattctt acagtccata ctttgcttaa atcctcagtt gttgaggtct gctctgctgt      360
cagtaatccc agctataaat ttcccccaaa tgtggggcct agataaagta gaagggtggat      420
ggactcagct tatttttcatg ggatgacagg aactggaaag agaaagggca ttgaaaataa      480
aaagttattc cagaatagca ttaaccctct tactgttcaa gaattaagaa agcctactta      540
gaaatgaggg ccttgagaat gatacccaaa tattggtctt tctacaaaaa aatggccttt      600
ccaaatatct gctttcctgt tcccccaatt gctttttaag tagaattaag ttacctaaaa      660
ctttacctga aggggtggttt t                                681

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<210> 190

<211> 839

<212> DNA

<213> Homo sapien

<400> 190

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taataagaac	actgtcttct	agatataagc	caagtttttag	gagttatctt	tgtagtttct	120
gtgttgagac	tatgggtctt	ccctgtgcaa	agacttgatt	agcaaatact	atttgaaacg	180
atcccaaatt	catagtgcag	ttgaccaccc	ttctgatcaa	ggggatctct	gtatatccca	240
tgaaagcttc	ataggtctca	ccctagatta	agtgtttcac	ttctcaagac	agtgaacaga	300
tggaagactt	ttgtagttat	cattatacaa	ctgtgccctg	tgtgttttat	tatacaacca	360
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acttgatcac	acatgccaca	ttgcttaata	tttcaagctt	agactgaaat	aatcctgtgg	480
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atgaataaaa	ggtttatgac	tgggagcatt	tacccatgaa	cctccttaga	agctatttaa	720
cctttctttt	ggaaagccct	gaaggctggg	aacttaaatt	ttaaagacag	tacctatttc	780
cagaatcgct	tccaaatggc	catgttttaa	agggccaaca	ttttgggatg	gccctgccc	839

<210> 191

<211> 697

<212> DNA

<213> Homo sapien

<400> 191

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ctcataagat	tttatcacat	ttcacagatg	aactgttaat	tgattccatg	ggtacgatta	180
ggcgagatcc	aagctggagc	tgcagctctg	agtcccataa	attctttgtg	cttctgtaaa	240
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ttaaaagact	ggaaatgtgt	aagtggagaa	aggcaataac	tgcagtaatc	tcttaccgga	360
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aaaaaccaa	atgggtaccct	ctatagcatg	caacttttat	ttcactccaa	acgaaaaatt	540
attttgacta	tggcttggga	aatccattag	tagaagaagt	tttataacct	ataggaaccc	600
ggccatttca	tttctaccaa	atcacaggaa	ttttagaatg	ggcaagggaat	ttacaggaag	660
acttgcccaa	ttatcttttt	ttgggggact	aaaccaa			697

<210> 192

<211> 687

<212> DNA

<213> Homo sapien

<400> 192

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aggatagttt	tttgctattt	ctgtgaagag	tgtcattggg	actttgatag	ggattgcatt	180
gaatctgaag	attgctttgg	gtagtatgaa	catttttaaca	atattgattc	ttccgattaa	240
tgaacatgga	atgtttttcc	tttatttggc	gctctcttta	atttccttca	tcagtggttt	300
ataggtttca	ttatagagat	ctttccttct	tttgggtaat	tcctacgtat	tttaatttatg	360
tatcgctatt	gctaaatgga	atgacttttt	aaatttcttt	ttcacattgc	tcctgggtggc	420
atattaaaag	ctactgatgg	atgggtgattt	tggattctgc	cactttactg	gaattgggtgg	480
atcagttcta	atcgttttct	tatgcacccc	tttacgggtt	ctacatgtaa	gaatatatca	540
ccttcaaaca	cggataaatt	gacttcttcc	ccatccaatt	gggaggccct	ttatatcttc	600
tcttggcctg	aaggctctac	ttaaaacttc	ttatcccttt	gttgggaataa	cagtggggac	660
aaatggacat	cccttgtcat	ggtccca				687

<210> 193
 <211> 493
 <212> DNA
 <213> Homo sapien

<400> 193
 ctgctaaaat gatgttgcta aagcattcct ttttcttttg attaaacttc atgtttacaa 60
 aaaaattaat tctagcagaa taacgaatgg ttttgttttc tagttctctg ctgaatgaac 120
 agttttgccca attatcttca tagagtagtg atataatgaa tgcaacctca aatgcaaacc 180
 aaccaattca cagtccatac cccaatcact tccttcatca gcctcaaaaa tcgctaagtg 240
 aaccagtaga atgggttttg agcagtaata ggaaagcaaa tagaaagtca agggggactt 300
 tcaacgccaa caagaccaat tcagatcctg atctgactgg tttctaatac aatctctttc 360
 cagagtaatg gagcatgagt ctgccacaca gaactttaga gagagtcctt tatttcaaag 420
 actgtaaaagt tggaagaatt cattcatctg caaagtcaaa tgtcaaaagt tgtgcttccc 480
 actcctcatc agg 493

<210> 194
 <211> 424
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (424)
 <223> n = A,T,C or G

<400> 194
 cyagggcant ttagcangas aaggaaatan mggggattca attaggggaac wraggakarw 60
 caagttgtcc stgtmtgcag atgmsgtgat tgtatatcta gamcacccca ttgtctcagc 120
 ccaaaatctc cytaagttga taagcawctt cagcarmgtc tcasgatser acmtcwatns 180
 gcraaantca cmwgcattct tatacaccaa tawcagacaa acagagagcc aaatcatgag 240
 tgaactccca ttcacaattg ctacnmaaga gaataaaata cctaggaatc caacatacaa 300
 gggatgtgaa ggacctcttc aaggagaact acmaaccact gctcaaggaa ataaaagagg 360
 atmcaamcaa atggaagaac attccatgct catgggtagg aagaatcaat atccgkgaas 420
 atgg 424

<210> 195
 <211> 229
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (229)
 <223> n = A,T,C or G

<400> 195
 tgaacaccct tnggaaggaa cctgctcgna tgtannanaa anggaccgga cagtctgcta 60
 aaatcgccct ctttagacgc ggcgcgccgg ggcagagttt ttctctggtg ctttgacctg 120
 tatttggttt aatgggttttg tcctaattctc ttcaatcaat aaaattgtgc gtatttaact 180
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 229

<210> 196
 <211> 557

<212> DNA

<213> Homo sapien

<400> 196

gcggtgggctc atgcctgtaa tcccaccact ttgggaggct gaggtgggca gatcacttca	60
agttgagagt ttgagaccag cctgggcaac ataacaaagt gagatcttat ctctacaaaa	120
aaattaaaca aacaaaaaaaa caaatcaaca ttcatttgca gggctctttg gtcttcttaa	180
agaacaaaca tatgaaataa ataagctgat tcttaaagat aacaaatata atgagctttc	240
tcaactgtaa aagcatctct aagttgttct atcaatgcat atccactcca tgaactaacc	300
tgaagaaagt gttgaccatt ctacccaatt aactgtaaac taagattgct ttaatgggtt	360
gcctaaattt gagtaccttt aaatttttgc tttttatcca aattcattct cccttcttca	420
aattaaatag ttttgtaga aatcggataa gcaagatgta ctttttagaa agggcaatag	480
aatcctacaa catgctagaa tttgaaatgt ttttttaaat cagtmmtttc tctatgctag	540
taactaagaa aattata	557

<210> 197

<211> 624

<212> DNA

<213> Homo sapien

<400> 197

ttttactacc tatatttaaa atgatccctg acgcccctca agacaaatat attaattttt	60
ttactttgtg ggatagagat cagaaaaaga gttagagatga aaatactgga gaaacaatgc	120
aggagatatt tatgagggtga gaatgtcaag aaacttgtaa agggagaata ctataatgac	180
ccctgaagag agagcttttag accagttgag tattagaggt tgccacgtgg ctattcatcc	240
actaataaat acaagaaatt actaaaatgg aagccactgg aaatatgttt tgaggaaggt	300
gagaatgtgg acctattata aatgggtgaa tatgatttct ttctcattaa gttcataaat	360
aactttcaga catgtaacag tttatgaagt gtgccgtagt catttagtat aagttttata	420
cacaaaagtg tttttactaa gactgtcaca ggttcttttg tgaatcttgt ttgtttttcc	480
tcattgtaaa tactgcaata gaacatttgt gtcttaacat aaggcaataa atgaccttaa	540
gaaccttcac ttttatatag aaagtggagg aaaagttggc agagtaattt gttgattata	600
gataaaagct cttgtagaaa ttgg	624

<210> 198

<211> 175

<212> DNA

<213> Homo sapien

<400> 198

tttttttttt tttttttttt ctaacactta tgcatttatt ttcattgtgta agaagaaaaa	60
cgtaactagc acgtgaacat gactgcatgg atacacggct cagcacgagg ctaaagtcag	120
aagtgagtga aagcaaaacc gcatgttgat ttaagtgaata taacagaaca gaaaa	175

<210> 199

<211> 871

<212> DNA

<213> Homo sapien

<400> 199

ctgttgatca atgatgagct cccaagagta accagcctct atatagtcag catcactggg	60
ttctcaggaa aagcatcacc attgttcac ttgctgcaaa atgtatgcac aagtatcttt	120
ttatttttaa aaaagccctg acattttatg actgctgctt ttctaagata ttttcaaata	180
tacagtccat acggttcaga cacaatggac tggggataga gacggctata gtgccgataa	240
tggagaaact agccagagct tcagatattt gttttccagg acatctcaat aattgggtac	300
acctcacaat atgtgagact tgacgtcgag tggcacggca tactctggcg caggcacttg	360

ataaagactg	tgtttgcaaa	tacttagcct	gcacttcaag	ataccaggca	tctaagcacg	420
tcccagatgg	tgacagttaa	tcttcaaaaa	accctatgtg	gaagtattat	cattgtcctc	480
attttacaga	tgaggaaaaa	gagacacagg	gatgtcaata	tcttctctca	ggtcacacag	540
caagtaagt	atggaacagt	ggctcagcca	tgaagctatt	gctgttaacc	actaggttga	600
tttgcccttca	ttaatttctt	cctaaaaactg	cacatttccc	gtagtccct	ctttttggtc	660
tgctgtttga	ctcttggtta	ctgcttagag	gaagattcat	tctattattt	tctaacttag	720
taaatatgtg	caactccttg	gggacatgac	caggcaaaaag	ctggatacag	aaatgtatgc	780
ccaaacacca	tcccaagtta	cccctaacag	gtcttttctg	gaccctgttt	gtaagggggg	840
tatatattgga	aaaattttta	aaattttctg	g			871

<210> 200

<211> 737

<212> DNA

<213> Homo sapien

<400> 200

gacattttga	aggtaacagc	aatatctgtg	tatagatggg	gttgtgggtt	tgttatttat	60
ctgctattgc	tgaactatcc	tttgtcttga	gcgataaaaag	agaagtaaaa	tactaaagaa	120
ctgaactgtc	catttctgga	ccatgagtaa	agatgctggc	tgtcaaactt	cctgttcata	180
cattagttta	tttatagagt	gtactctcta	tgtaagggtat	tgactgataa	tgttactttg	240
acttcagata	gcttgcagtt	taatggagga	agaagacaaa	catgcaaata	actaggtcaa	300
tgaggcatcc	tttgtgttcc	attggaagct	aggctgcttt	gtaaccttgt	taatttctgt	360
ggttttggag	tgcattcatt	agcaaataca	ccccttgctc	ttatccattc	tctgcttttt	420
tctttatttg	gcatttgatg	acattttttc	atgtggggaa	attgagtcag	gtgagggtga	480
aagaaaaata	ggacacgaca	ctaaattcct	tgatgttttt	ccttaaaaaa	ttgtttttca	540
agtgtctccat	aaagggttgt	gaagttttta	gagccatagg	acttgatta	ttgtgaaaga	600
gtgtctctag	ggggccaggt	taaaccattt	caaggactct	ccttctctca	tctcccttgt	660
tccacccagg	gtggcgaccc	ccaaaaagca	caaagcctcc	ctttcttcat	gggaagggtg	720
aggaacggaa	gggaacc					737

<210> 201

<211> 493

<212> DNA

<213> Homo sapien

<400> 201

tctagaaaatg	cagcttttat	ttattacccc	atttctttca	agtccttgga	aaataacata	60
ttaagggtac	aagaaattaa	cacatgatgg	aaaagtcatt	gtgacgcaa	tgaatttcat	120
tgagtataaa	ctcatctact	tcaaatttat	tttataacac	aacctaaagat	actcaagata	180
attattttaat	ggttagctct	taagttgaat	tggtctacat	aatgctggg	aagaaaacca	240
gatttttagc	cttcttgcca	aatccagacc	tctggttgat	ttttctttga	cagaagatgc	300
aagttatttt	ccaatttcac	aattaaatgt	atttaacatg	aacattattt	tgctttaaaa	360
actataaaca	ttgtaggaga	attatagcca	gtcttcagtt	ataaccactc	caccctctc	420
actttctctc	tctctctctc	tttttttttt	gctatgggat	ttaatgggaa	aaatatgtaa	480
aaactgtcac	ttaa					493

<210> 202

<211> 283

<212> DNA

<213> Homo sapien

<400> 202

cctttttatc	tcagtgacac	cgtccgggga	cgcaggtggg	ggtgactcaa	ggctagcctc	60
aaagggcagc	cccacctcct	catcctggac	cacagagacc	acctgcttgg	cgcgccgtcg	120
cttttccgag	aggggtggctg	actccggggg	gctggggctg	gggctgccgc	ccccgccgct	180

gttgctgtac tcctcgcccc agtcgatggg ggctgccctc ggacagcagg tgcagggttg 240
gggcactgtt acgcaagacc atgctgcccc gagaggtaga tct 283

<210> 203
<211> 713
<212> DNA
<213> Homo sapien

<400> 203
ctgcttttgc gcaaggtgcc actggacgag cgcctcgtct tctcggggaa cctcttccag 60
caccaggagg acagcaagaa gtggagaaac cgcttcagcc tcgtgcccc caactacggg 120
ctggtgctct acgaaaacaa agcggcctat gagcggcagg tcccaccacg agccgtcatc 180
aacagtgcag gctacaaaat cctcacgtcc gtggaccaat acctggagct cattggcaac 240
tccttaccag ggaccacggc aaagtcgggc agtgcccca tcctcaagtg cccacacag 300
ttcccgctca tcctctggca tccttatgcg cgtcactact acttctgcat gatgacagaa 360
gccgagcagg acaagtggca ggctgtgctg caggactgca tccggcactg caacaatgga 420
atccctgagg actccaaggt agagggccct gcgttcacag atgccatccg catgtaccga 480
cagtccaagg agctgtacgg cacctgggag atgctgtgtg ggaacgaggt gcagatcctg 540
agcaacctgg tgatggagga gctgggccct gagctgaagg cagagctcgg cccgcggctg 600
aaggggaaac ccgcaggagc ggcaccgcag gtggatccag atcttcggac gccgtgtacc 660
acatggtgta cgagcaggcc aaaggcgcgc cttcgaagga gggggctgtc caa 713

<210> 204
<211> 275
<212> DNA
<213> Homo sapien

<400> 204
gtagacaagt acagcagatc cagacaccag atctagctag gctaaatgta cagtatctaa 60
cttgatctga actgaacctg tattccttga tgatgcctaa aactacatcc atagaattct 120
ggatgaacctg taatacagtt ctgaaagtac agttttatat aataagatgc tgatctcttt 180
attctttcaa gtaagagtgc tagagaacaa attgtgttac ttgccttggg atttattgaa 240
cgtctggaaa atgctgtctt cctagatcca aacag 275

<210> 205
<211> 694
<212> DNA
<213> Homo sapien

<400> 205
ctgttcctgt acattttaact gaaaaaaaaaag taacttaaaa taatataaaa atagcactca 60
tgtatgtcct acagttatag gtgaaatttg atattgtttg tcttacatag catacctata 120
gacagcttaa gtaaagtgac tgtaaagagg gttatgctta ttgatgaact cttgtagttg 180
cttaccagct ctgttagtat agttaaattg atctcagtag cttcaagtat ttataaaatg 240
gttgaagtcc aaatacatgt gataattaca atacactttg aattaatgga ggggtggagg 300
ctagttgaaa tgcattttat ttacccaagg agtatgttaa aatgatagtt ataaatgttg 360
gaagtttaaa gcaagatact cagtttagtt ctttacaat cataagaaga acaaaattag 420
atgttgacat tgctatttta ggctgtgtgt tttccatatg cttcttgctt tccctgtcac 480
agggtggggc agcaatattg gtgtgattga ggttatgctg gcaccactcg cacacaggcg 540
cacaatgggtg ttagctgggc agaaagagtg gcatctctgg ctaccgggct gggggcgacc 600
tttaccatag gatgaagtaa ccttgcatc ggctgcaagg tgtactgtac cgtacacagg 660
tgctgggtcg atggccactt tctgcttttc tttc 694

<210> 206
<211> 704

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(704)

<223> n = A,T,C or G

<400> 206

tttttttttg	gnaaaaaacag	ggtttcatca	tgtttgccag	gctagtctca	aactgctgac	60
ctcaggggat	ttgccgcct	cacccaattc	aactttcgta	agtcagtatt	taccatctaa	120
ctcagtgtcc	caaaatttaa	aatttccttg	cactttacag	caaaaatata	tattggggct	180
ctactgaagc	aatatataca	tgtcaaaact	aaaaatcaga	aaagcaaaaag	gggccattca	240
acatatagca	gcttatattt	aaatatgtac	aggtatgtat	gttttcacag	ttagatcttt	300
aaaaaaattt	atatttgata	tgttcaaaaa	tacttctatt	ggctataaat	aatattttta	360
aagctcaact	gatcaaaatg	cattccaaga	acatatcaaa	ttaaataaat	cttctacgtc	420
tttaaaaaaca	gataattgaa	gtcagtaaag	cttgaggttt	gtgttaagtg	tattctgtca	480
gtccctacta	ctagggaagg	cagaatcttc	taaatacgat	acgaaagaaa	ctcccaaagc	540
ttggaaggaa	tcggcagctc	ctgaactttt	tggggggggc	atccctcttc	gggattgaca	600
tgcgacataa	atgttgcaag	ctaagggacc	cccccgggg	gagtggggcc	caaaaaaac	660
cacaccttcc	ccgtcaatgg	tggtcccccc	accaacctta	aaaa		704

<210> 207

<211> 225

<212> DNA

<213> Homo sapien

<400> 207

ccattttaac	tgtactgcc	atagaattct	ggaattgtgg	aaaattgtat	cattgaagtt	60
cagtaggatg	tgtggcttaa	aaatttatca	ggaccacaaa	aaagaaaaca	aaaatatttg	120
gtactgaggt	tcattgccag	ggcaggaggt	atttccagaa	aatactcatg	cctgtgttct	180
gttccttgct	ttcccaaata	ctgcatgtga	ctttcctaag	cygca		225

<210> 208

<211> 678

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(678)

<223> n = A,T,C or G

<400> 208

cctatatcta	tcaaaaaaaaa	tccagttcct	aactaataat	ctcccaaaaa	gaaagcacca	60
ggaccagatg	atataaatgg	caaatttttt	caatcattta	aggacaaaat	aataccaatt	120
ctgtatcatt	tcttccagaa	cacttcctaa	ctcatcgtat	gaggccagca	tcactctaatt	180
agcaaaacca	gataaaagcca	ttacaagaga	gagtgacaga	ccaatgtggg	tttattgagg	240
atgcaaaca	aatttaacat	aatattta	agtgaaaaa	tggtatgctct	ttccctaagt	300
tagagattaa	ggaaagaatg	tccccttcac	tactcccata	caacacctta	ctgaaaattc	360
tagctagctt	tataaaataa	anaaaaaacca	naaaaataaaa	taaaagggtg	acagactgga	420
agatacagtg	aaggagggaag	aaataaaaatt	ttctttgctc	ataacatgat	tcttctatgt	480
ggaaatcaca	gagatttgaa	catttttttt	ttttgagaca	gtttttgctc	ttgttgccca	540
ggttggagtg	taatggcgcg	atctcggctc	actgcaacct	tcacctcccg	aattcaaggt	600
gattctcctg	ccctcagcct	tcccggagta	agcttgggga	ttaacagggc	atggcacccc	660

ccatgcccc agctaaat

678

<210> 209
 <211> 720
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(720)
 <223> n = A,T,C or G

<400> 209
 attattttga accctagcat ttagaaatga aaaacttttt ataacaatca aatacatgat 60
 aaagtatgca aagagtagga aattattctg atgacatatg gaggggttaca aaggagaaaa 120
 ctttttgcta cctctgataa agaatagact aaattctcca agaccaatct gactgggtgct 180
 ataataaaaag gaggtacaca cggaagcaca agggatgtgt gcctctggag gaaagggtcag 240
 gtgaggactc agtgagaaga caagccaagg agccaggtct tggaagaagt caaccctgtt 300
 gacaccttga tcttggacta accctgtgga caccttgatc ttggactttt agcttccaga 360
 actgcnagaa aataaaatttt tcttgtttta gccacccana gtgtantgtt ttgttatggc 420
 agccctaaca aattaaaatt atatttttaac agagaatata aaattctaata ataacatttt 480
 acagtaaagc attcatgggtc ttttttttct tattaataaaa tccatcaaaa cagaaagttt 540
 tgcaaaaattt taacacattt ctctaccact actgtttcta ctctcttaaa actactccgc 600
 aaatataaaa atagaaggcc aaaatgcatc attaaaacga tgtttgggga ctaatggcct 660
 taaaattcta ttacacttgg aaatatacaa atattcaaag attatctatt gatcacctca 720

<210> 210
 <211> 277
 <212> DNA
 <213> Homo sapien

<400> 210
 tccatgtatt tttatacaga atggaacaat atgtatgtat gcaatyktta cattccacca 60
 tgaaataaaa cagtataatg aaaataacaa tagattcaaa caatgatatg ctattttttt 120
 ttacctatga cattggcaag gtcttcttaa aaaatctgcg aataaccgat gttggagaga 180
 tcatggggaa atagccactc aaatgttact catgagagtg tacatatgtg taacttcact 240
 tggagggcaa tttggtgata catttaaaaa gtttttg 277

<210> 211
 <211> 715
 <212> DNA
 <213> Homo sapien

<400> 211
 gtggtagaaa tactaatttt gcaattacag aaaaaaacia atgccattca catgggttyct 60
 aacaaaaagt gtctgaccac cccaccccc caccctcaa aaagccctta aataaagagg 120
 aagatcaaaa gaaaacaaaa taattcccga gtttcacctc atacatacaa tatagcacag 180
 gaagtggcaa agtttaaaat aatgccttta ctgttaggac tagtatgctg tcaaaagcca 240
 caatcctttt gtttttagtga gttgattttc aatagaaaaa tacaaatgaa catgtgttta 300
 agttccaaca tggattgagc acctctgaat ttagtatcaa atgattaatt ttatttttca 360
 gatgtcaaat cttagtataa aattttccat tatttttaaac ttcacttgaa tctttaaaaa 420
 agctgtctaa attgtactat atgagttcag ttttaattctc tgtaaaatgc taacaaattg 480
 aactgtcagc agtcttttaa aaaaaaatgg gggctgggtt atttctagaa gaactctcat 540
 taagctttga aaatcagaaa tcagagacaa ataacttcag atatagacta gctccacaag 600
 caaatttata caattatctg taacagtcta tacatatatg tgtatatata tataccgtaa 660

ccacttttcat aggtataaaaaa tattaacttc atgtcacact atgatcagaa gtata 715

<210> 212

<211> 717

<212> DNA

<213> Homo sapien

<400> 212

agcctccccc	aatgccttaa	aagggtcacag	tagatctcag	ctctgaacag	aaactcaact	60
gaaactcttc	ccacaaccca	gcagtagata	tattaaaacc	tacaattttc	agggatacaa	120
ccaatatatta	attcttttga	gggtttttgtg	tttaatacaa	ggacacaaac	acacgtataa	180
aatgacgatg	tcaatactga	ttaaacagaa	caacaaaata	agaagctcaa	attatcatca	240
gctatttgtg	atatctgaaa	taacaataat	gcacttgatt	ctgaaagaat	gattagagtt	300
cctactctga	aaatctaatt	gtcttgatgt	ggcgaagtga	gaagaaagga	tgatttttct	360
aatgaaaagc	atgtatacgg	gtagcccttt	gcgagattct	gtcaaaaccc	tgaattttgc	420
attagctgtt	ttaccaccca	aacgttttta	cccaggatg	tgcagcaatg	ggaactctca	480
tacactgctt	gtgggaatat	aaatcagtat	aaccactttg	gaaaaccatt	taacattgtc	540
aactacagct	ctacacacaa	gtgctataac	caccatttcc	actccagggg	atacaccccta	600
aaaatatgaa	gtgcccattg	ctacccaaaa	ggcgccttaa	aaggaatgct	tttgagaagg	660
gttaaccttg	ttaattagt	gcaaaactgg	gaaaacaacc	cccaaagggt	cccatcc	717

<210> 213

<211> 599

<212> DNA

<213> Homo sapien

<400> 213

cctgttttgg	cgaggcagga	gggaagcggg	atgggagtgg	tggttaggcc	aagggtagtt	60
caaagcgatt	cagcaggatg	atgaccacag	gagtgcctga	gccgggcctt	tcagcccccg	120
tgtggatgat	gaccggccat	ccaggacatg	cgagggtctg	ggacagtggg	cagccagtgc	180
cacacaagga	aggaccgatt	aaatgacaca	gttaaaggaa	tttggcctag	ggagtgcag	240
ccagaaaggt	ttgggtcttt	tatatatgta	acattggaaa	aaaggaacat	ctcctgttcc	300
ctgtattaag	ttttgacttt	agctcagcaa	atgcagtgtt	tgtggcagta	aatatactct	360
gataacaatg	ttctttccca	ggaatttaga	gttttatgat	ggttattgaa	aatgtttaca	420
tgacaggctg	tcaataatat	tttttgcttc	taaaaataaa	acatacataa	agtgtacgga	480
ttttaagtat	gcaactcact	gaacttttca	taccgtaata	caccacccta	gtaaccctcc	540
cccagttcaa	gatgtagact	gtttccaata	acccctcatc	ctgttcctta	atagcccc	599

<210> 214

<211> 789

<212> DNA

<213> Homo sapien

<400> 214

ccttatgaca	aaccttgcta	tgccaaggat	atgcttcact	atcttcatct	atcaaaacac	60
tatgcatcat	agatatctaa	ttttttcatc	tcttgcata	agtctttcct	gatttccttc	120
tgctgaaatt	tctctcttca	aatgatgtgt	ttccatagta	ctttgtccct	tttcaaagat	180
atatctcaca	tcgcatattt	taccacagtt	agtttcattt	cttaactctc	acactagatt	240
acaaagtcaa	tatagacaaa	gaaatgttca	accttatata	acctcctctg	cctatgctgg	300
taaattgcac	ctactatgtg	ttcaataaga	gcttgtcttt	ttcaatatac	aaaactttgt	360
aaagattaaa	gacctttagt	aaagtcaaga	ggaagatagc	aatttcactt	ctaagaactt	420
accctaagga	aacattcatg	aagagataga	aggggttatg	tgcatggatg	ttcattatca	480
tattattctt	cattatgaag	attatgatgg	taataatgaa	aatgattatc	ttgtattggg	540
ccttatattg	agtcaagcat	tgagaatgta	ctttatctgc	attatctcac	tgagttctcg	600
tagcagccct	ataagggtaca	gactgttatc	taagcttaaa	aaaataaagt	taatgtccaa	660

gggtcaaacaa	ctagtaaaaag	aaggggggcta	ggaaatttgg	aacccccaaaa	ggggcaacct	720
ctcaaggggt	atgaatcctt	accattatta	taaggaagct	tggcccatgg	tggcccaaaa	780
aaaaccggg						789

<210> 215

<211> 765

<212> DNA

<213> Homo sapien

<400> 215

ggatgtctga	gcaggagaga	gaccatgtga	aggatggact	gaatggagac	ttgtatcaaa	60
gagtctgagt	atcaaagact	tgtattagag	agggttgttg	tagtaatcta	gtcaggggtat	120
gagaaatggg	ttgtattaga	gtgtcaggag	tagtcgtggc	aaaaatatat	agatcaggat	180
gagggatggg	cctcatctca	caccctgact	ccagtcaatg	gcagtggctc	cctggagtac	240
actactatag	gaaggatttt	gtaaagtgtt	gtctggcctc	agtggagggg	gaggtagggg	300
aggagtctta	tgaacagtta	gtgggtgtctg	ccatgggttg	aacaatggag	aagggggaca	360
ccttttctgt	gcagatgttg	cttctggtag	atataatcca	caatgtaatg	ggagaagtac	420
taagaatcag	taaattatgg	aggggtgtaa	agactactga	tatttaagcc	tgcggaccgg	480
acttagagaa	atgatagtta	aaggagaaat	atccagcaaa	caaagatatg	acattgaagt	540
ttgggactgc	gattagtacc	agagatttgg	attggagggtg	atttgtatag	aatggatagg	600
tgattttact	cttgcaattt	ggattgaggg	gtggggaaaa	ccagaaaggg	gctggggggg	660
aaattagtag	aagggtcacct	tgaattcatt	gtgggtccata	tcaatgctga	aactgattgg	720
ggaacttttt	actcttgagt	ccctttgtaa	gggaacccca	gaaag		765

<210> 216

<211> 780

<212> DNA

<213> Homo sapien

<400> 216

cctttttctg	tggcaaatgg	aggcttttca	ctgcctgtag	agacaataca	gtaagcatag	60
ttaaggggtg	ggtcagaaca	tgttaagata	acttactgta	tatgtattcc	cttgtatttt	120
gttaaagctg	gaacatttga	tattttttcca	tttatttatg	aaaaaatatg	aacctatttt	180
catttgtaca	aggtaattgt	tttttaaagc	aagtcacctt	aggggtggctt	taattgtata	240
agtcaagcac	atgtaataaa	ttcaaaacct	gcagttaaca	ggatattaga	catcaatcct	300
ggtaacccaa	tattaaagat	tctcttttaa	aaagactgaa	catgtttaca	ggtttgaatt	360
aggctaaaag	gtcttgcagt	ggcttttcat	ggcccttcaa	attggaatgg	aactactgta	420
ctttgccatt	tttctataaa	tcagtacttt	ttttttaatt	ttgatataca	tttgtgtgaaa	480
aaagaaaatg	gctaataaac	tgtattaaat	cttaaacaa	gtataaagat	tgcacttagc	540
cagttcaaag	tgtatactta	ttcataatga	attataacag	ttatatattct	gtgttttctt	600
gtaaatgttt	cttttccctt	aaatacagat	aattcatttg	tattgcttat	tttattatga	660
gctacaacaa	aaggacttca	ggaacaagta	atgtattagt	atgggttcaag	attgttgata	720
ggaactgtct	caaaaggatg	gtgggttattt	taaatataaa	tagctaattgg	gggtggtaaa	780

<210> 217

<211> 810

<212> DNA

<213> Homo sapien

<400> 217

cttttaggca	gcccggcacc	ttcatccata	ggcagagaga	gaactgggtg	ttggagactt	60
attcgagggg	ataggaaggg	ccctgtgaag	ttgatttaac	ttttggatgt	cagactgtga	120
aagctcctga	gaaacttggg	gtaataggat	cttcttttgg	ggatgaaaat	ggggaaggcg	180
tgaggaccta	gactacttct	ccctaggtca	gaaaaagaga	attaccctt	gacaaatatg	240
atacctgcta	ggtatttccc	agggaaattt	agggattggc	gtctttccct	agcatgtgga	300

ggaattggca	gacagcttcc	taagggcggg	gagcgggggc	ccaaggctga	cactgcttgc	360
atccacgtga	ccttaagtta	tggcagatga	ctctgaaacg	gactgaggcc	aatgagaaca	420
gatggatgga	gcactcaggt	tagacttggt	ccttctccta	tgctggagga	gagggatggt	480
tctctagaat	gttggaggtg	agttgagagc	tgcctctctg	aatgttgaac	agtgtactct	540
tctgaaaact	gcatattcac	tttatgtggt	ttcagaatac	tgggctcaat	actaacataa	600
gaaagacact	tcattgagaa	attcttaagc	ttacagaaaa	cctatctctt	tgcacattcc	660
acataacccc	tagcaaaatg	caggttcttc	atacttctgt	cctttttcca	ttggaagaat	720
tgcttaagga	aaaattaatt	cctattttatt	cccacaaaag	gttgggcatt	gctttgattt	780
taccccatgg	gggaatgtgc	ctttgaattt				810

<210> 218

<211> 817

<212> DNA

<213> Homo sapien

<400> 218

ctgctccctt	atggaggtct	cttcattaat	aattattgga	tagatagaga	aggtgagcct	60
gtggcttcca	agtaccggct	tttgc tgaag	gtctacatgg	gaagaagagc	atcatttgat	120
attcagtaga	tctgccacac	ccaactggct	ccatctcctg	gaaaacagca	ctcactacaa	180
gcaactgtaa	tagcaccag	caatgaccac	gctgctcctg	ctggctcttc	cgtacaccag	240
taaatgaact	caccaatgta	ttgcacacat	acatttcaca	gtagtacaat	aaagccctgt	300
atcaggagtg	gtaattcaat	gacttgactc	tatagtgcac	tgcagcttta	tgtcatacca	360
acattcaaata	attcaaata	ccttccaatc	catttg gaca	aaaatacacc	atggctgccca	420
agacacatgt	atttttcttt	cttccatgga	ctcctaaact	gctcccacaa	tcagcagtg	480
tcttctctca	gaaattatct	taagcttctc	tactcaatgg	gaggtacaca	cagagacctg	540
agaatatgca	gaggccagaa	tctctgtctg	tgctagagat	caactgtact	ctgcccacct	600
ggggaacaca	tcctctgggt	aaagtactcg	gaagtaaat	acattccctg	gagacagata	660
cgggctttca	ctgcagcctg	ttagaaaaca	caatgtctgt	aagttacctc	ataggtcaaa	720
gagttttgga	ttatatTTTT	cataatgggg	ctatggcctt	tttaccctgg	ttttaataca	780
gaaccacctg	cagaaaggac	attgaaatta	aaagcca			817

<210> 219

<211> 661

<212> DNA

<213> Homo sapien

<400> 219

ggatgctgag	gcaggaggat	tgagtccctg	agtttcagga	tacagtgagc	tatgatcatg	60
ccattgcact	ccagcctggg	caacagagca	agattctgtc	tctaagaaaa	ggaaaaagaa	120
aatgaataga	tagtgggtatt	agatgttaat	gacatcagtt	gtttttattc	tttattcttt	180
cttagaaaaca	gattagtttt	ctcgaattaa	agaactacca	tttttctttt	ttctacaact	240
ttcaagagct	ggtgaagaaa	tgatgtttag	atttaataga	tatagtagca	gtcatatatt	300
aatagaatag	aaactgagac	tctaggaaaa	agatagacat	gagataagga	gtaggcatgg	360
tagacatttc	tagattattt	atgaaaatgt	tgtagaattc	atTTTTTTTT	ttggtctgac	420
ctttggcaat	ggtgctgagg	aagggaaagc	cagcccatca	ggcaaggctc	tgTTTTctgc	480
attttatccc	gtttgattct	tctcgttagg	attggagcaa	ataatttcaa	tatgttcttc	540
gctgggttta	tcatagtgac	ccttcattta	aagggacttt	taacaattga	cttaaagaac	600
actgagatgt	gatattttat	tgggatttga	aagttgccat	tgggttttac	cttccttaat	660
t						661

<210> 220

<211> 792

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(792)
 <223> n = A,T,C or G

<400> 220

cctctttttta	ttcctacaaa	taatttttcaa	gtacacacaaa	ttgggtaaac	aaagaaacaa	60
agccaccaag	aatgaaaatc	agtaggaata	acgaacaaga	ctcacagatg	tcaaacaagt	120
ctgtgggtct	tgcagacttc	agatgttgga	attattagtc	gtggcaagng	nncaaaacat	180
tagctattac	cattatgttt	accaactagt	gaagtgaact	atgagaggat	atattaacca	240
cagaagttaa	tagaagaata	gactcctgaa	aatatctgga	tgctacaaac	taaaatatag	300
tatataatcc	ttcatagagt	gtcagtgact	tcatatttat	aattacattt	ttgtatatta	360
gcagtgttct	agttcttact	gccttatctt	taagctgann	nnaaataaaa	ttatatattt	420
ggattcaaaa	acacatagct	aatgattact	atgtggcagt	gttacattac	tttatcacat	480
atcattaaca	taatctgcat	gtgttcaaag	agatcttcat	acttctttgt	agctcccact	540
tctttgtcgt	ctttgtagct	cccacaacat	ctagaacagc	acaaccgtat	atggagaaaa	600
ctcagtctag	tattcgttga	atgactaatg	gaaaatttag	ttnataaaca	gaactttctt	660
cattgnacaa	attatcttgc	agaagaataa	tggccttagt	ttaaaattat	catattttacc	720
catntcncca	ngttatttta	tctcttttgg	ctaanaattt	tgaaaacggt	accttttacc	780
ctttggcatt	tt					792

<210> 221
 <211> 759
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(759)
 <223> n = A,T,C or G

<400> 221

cttttctgct	gctccgggag	gtggagtggc	ctggcagagg	gcacatggct	gccacctgct	60
gcaaggaaaa	ttctcagtga	agactcctca	gtatgaagga	gataagcctg	cacaatcagt	120
cactgataga	tgcttagtgg	aaaaacttcc	aattcccatt	tacagctctc	agagctagga	180
ttaaaaactc	ctggtcataa	actcatgtga	tgagaagtta	tagcacgccc	tcatttttcta	240
catanccact	tgcatttatg	gttggttttt	gaacttgcta	gaagggaaaag	aagtgcaaat	300
gtgtcctcct	tagagctact	ctcctccctt	tgggtgggtt	ccagtttgtg	cattgtccag	360
atggcccagg	agctgacgat	caaagggaaag	aagtcatggt	tgtcatgaga	atgctttgct	420
gcatcaggat	tcagtgaagc	tgttcaccgc	ctggagccca	tgcagcctca	agaggcagga	480
tggagctcag	aaaccatcac	tgaggttaga	aagtgagcac	caaagttgag	ggaagcccac	540
aggagtgagc	cgaagtgtct	cctttggatt	tccaaagtgg	gtgctgctgc	ttcttccatc	600
agccttgctt	ctgaccccaa	tgcgttcctg	gtgccttctt	cttggcattt	tgctgtcggg	660
ggcccaagga	aaaaaattcc	tgcattggcag	tgggtgaaaaa	agatggctgc	ctgctgaaac	720
ctgatttggc	ctgggtaagc	cttttggagc	cccgtttaa			759

<210> 222
 <211> 699
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(699)
 <223> n = A,T,C or G

<400> 222

ccttntnaag	agttggcatt	aattcttcac	taaatgtagg	agtagaattt	atcaggtaag	60
ccacactgac	ctctggnctt	nttnncgccc	gatgattttt	aattagttga	atccctttac	120
ttgttatata	tgtattcata	tattctgttc	cttcttggtt	ttacttttat	gattgggtgcc	180
tattgaggta	tttatttcta	gtttgtggta	cttcatgtgt	ttagggtttc	tagacagtgg	240
acatagaaga	ttcaagaagc	taaatgtagg	agaatgtnta	atgtaggana	ntgaggcnac	300
natatcatca	atgaatgact	tgaagtttcc	tctgttgtaa	agaatgatat	taccataact	360
gccatagnta	atattgatgg	tgtaagtcaa	ataanaaggc	aggaggaaag	ggacatccat	420
cactgaacca	canatcagag	ntcattgaa	gcctttgaga	agaatccaca	aaattttaca	480
ggataattca	tttcctgcca	tcaccacnag	aagagaaact	ggttaaacag	acaggatttc	540
cagagtccaa	aaattttacat	ttggtttcng	aaccaaagac	ctcagctccc	aggccacagc	600
aaaagggggc	ttatgaattc	cctggcaccc	agncccaaga	cccaanaacc	tcattcttgat	660
tggtttnggg	cttgggaaac	caaaaaacca	atgggtggc			699

<210> 223

<211> 598

<212> DNA

<213> Homo sapien

<400> 223

aaaaagagaa	agtttcagat	ttgccattca	aggcttattt	atatatatgt	gtgtgtatat	60
aaatacatgc	acacacttgc	atacatatat	atttttggct	gggggagtg	gagttttgcc	120
tttctaaggg	agggaccg	caggctcctt	tgttctgtat	tctggcgag	atgggtcctg	180
gccttgtgtc	actggcttat	ccttaaagat	catctcccat	cctcccagc	gccatctgtg	240
tgcagcaacc	agaaagggat	gaacttgccc	ctcttgccgg	cctggacaag	gtctcttctt	300
taccctttct	gttgccagtc	agcaacctgt	aactcacatt	ctcttcccag	tgaatccctg	360
ggagcgcctg	accctgggtg	gctgttcagc	ttcctgctgc	tggggccagc	aatttttgag	420
gatttatctt	taggccaggc	ttgcctccgt	acttatccct	gctctcccat	ttctctcttg	480
tttgagagag	aatgaggaag	caaagagtga	gaaagaatag	gggctgaaga	cgccactccc	540
agatggctct	ttctatcctg	ctcttctgtt	gaaacacacg	tgctgtgggc	ctcaggcg	598

<210> 224

<211> 501

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(501)

<223> n = A,T,C or G

<400> 224

aaacctttat	gatgacttcc	ttatgaatta	ctgaacgaac	actggaatgg	gactcaggta	60
tcctgaggac	atctctcaac	tctggcctta	gttccccctc	tgtaaaatta	gggtgccaac	120
taaatgatct	acaagggtccc	ttccagcgcc	gccattctgt	aattacatca	tgtgtaactg	180
tattaaacat	acacaagtga	ctgccaggca	tgggaatgta	acttccgagt	aaatgctttg	240
gtttgttcag	aatacactat	gaacttcttt	ccaaagacgg	gttgtggtaa	atagtggata	300
ttttgattat	aagaaataga	gtttccttga	agcttttagct	ggagatacag	caatagtgtg	360
gtgttcctac	aaatatcaca	gtgtattcaa	acataatttt	ctatcaaaaa	tcatttttgt	420
aaaagctgtg	tgttttttatc	caacttgtga	taataaatgt	tctttatttt	agaacaaana	480
aaaaaaaaaa	aaaaaaaaaa	a				501

<210> 225

<211> 295

<212> DNA

<213> Homo sapien

<400> 225

cctgtatagg gctcgtttcc ccacacatgc ctattttctga agaggcttct gtctttatttg	60
aaggccagcc cacacccagc tactttaaca ccaggtttat ggaaaatgtc agggaaaaaa	120
aaaaaaaaa cacatgcact cacacaatac ccaaacatca raattagaag ggcataaaac	180
agggggcttt ataggctgaa aaatatctta ratttcaraa cagaatacca atcaaatatt	240
gaaaattcct ttgttcaaaa cacaaagatg ttttggtttt aatgggagtt ttttt	295

<210> 226

<211> 372

<212> DNA

<213> Homo sapien

<400> 226

agattcctgg cttagagcat gcgagcattg aaggaccaat agcaaactta tcagtacttg	60
gaacagaaga acttcggcaa cgagaacact atctcaagca gaagagagat aagttgatgt	120
ccatgagaaa ggatatgagg actaaacaga taaaaaatat ggagcagaaa ggaaaaccca	180
ctggggaggt agaggaaatg acagagaaac cagaaatgac agcagaggag aagcaaacat	240
tactaaagag gagattgctt gcagagaaac tcaaagaaga agttattaat aagtaataat	300
taagaacaat ttaacaaaat ggaagttcaa attgtcttaa aaataaatta tttagtcctg	360
atgaaatgaa at	372

<210> 227

<211> 599

<212> DNA

<213> Homo sapien

<400> 227

ggcccccgtc gcgggagccg cttcgggcct tctgggcatg tctgccatat ggctccaggt	60
ttgtttttct ccccggcact ctgacgggga gggctcccgg catctcctgg catccgggta	120
gaggacgcgg aggatgctga gctgctggcg cactgcagca caactagaga tgtacggatg	180
cccccatctt gatcttacag aatcagaggt acagccgcga gaaagagtca agaacagaca	240
gagtcgcttg aggactcagg aggggtgttg ctgctgtgac aacagactac accctcacag	300
tttgctctgc tcttccaaca ccagtggaa atgatcacat cccagggatc agtgtcgttt	360
agggatgtga ctgtgggctt cactcaagag gagtggcagc atctggaccc tgctcagagg	420
accctgtaca gggatgtgat gctggagaac tacagccacc ttgtctcagt agggatttgc	480
attcctaacc cagaagtgat tctcaagttg gagaaaggcg aggagccatg gatattagag	540
gaaaaatttc caagccagag tcatctggaa ttaattaata ccagtagaaa ctattcaat	599

<210> 228

<211> 343

<212> DNA

<213> Homo sapien

<400> 228

aaagtaaatt gtatgaaaaa ttcattttctt caattgcatt agccacattt tgagtattca	60
tgtggctggg agattctgta ttagcacaaa gatatggaac atttccatca ccacagaaag	120
ttctgttggg cagcactgca ttagaatatt ttcatactgc tcttctctca ttaatttttg	180
ttgttaatgt tgatgtcttc attggatggg tcataatgtt ccatgaaacc gctcaagtac	240
acaattgtat gttctttgta tcccttacca caaatatctc gctctgctca tttcttttgc	300
agcttcctat aaagtttgtc ttcctcaaaa aaaaaaaaaa aaa	343

<210> 229

<211> 417
 <212> DNA
 <213> Homo sapien

<400> 229
 ctcaagctgc agtccaccgg gtatgggttct ggatgggttcc cccaagggag caggtatgta 60
 ggaggtgaag aaaactgaga tttcaagtat gggagagttt ttactatctc cattcctgga 120
 ttaaaaagtgc tgaaaaagtc cacagttaaa cattccttta ttcaccctat ggctcccaag 180
 aaaagcattc ttctctgga gtactgggtgt actaagggga caatacacca aatttggtga 240
 gtttacaatc aagtctacta aggttggtgt tccttatcag tttggcagag tcccagggca 300
 gaataatcat ccatctacag gtctctgttt cctctccctc cgcagcagtg gagagcatcc 360
 cagtgtttgg ggcactgtgt tcctcttcgt ccctgcacca gacctggaa gccttgg 417

<210> 230
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 230
 gaaataccag aagagaaagt ttcattgtgc aaatctaact tcatggcctc gctggctgta 60
 ttctttatat gatgctgaga ccttaatgga cagaatcaag aaacagctac gtgaatggga 120
 cgaaaaatcta aaagatgatt ctcttccctc aaatccaata gatttttctt acagagtagc 180
 tgcttgtctt cctattgatg atgtattgag aattcagctc cttaaaattg gcagtgttat 240
 ccagcgactt cgctgtgaat tagacattat gaataaatgt acttcccttt gctgtaaaaca 300
 atgtcaagaa acagaaataa caaccaaaaa tgaaatattc agtttatcct tatgtgggcc 360
 gatggcagct tatgtgaatc ctcatggata tgtgcatgag acacttactg tgtataaggc 420
 ttgcaacttg aatctgatag gccggccttc tacagaacac ag 462

<210> 231
 <211> 328
 <212> DNA
 <213> Homo sapien

<400> 231
 ctgtgggttt tcctaaacgc cctcatctg gttgaagccc tagtgtttct ttctcacatc 60
 agaggcaaat gcattggggg gggctctgggt tggacaataa atttcctctg gtttggacca 120
 agaaaaacag agttctttga ccgctaacat atatgtaaaa agaaagtttg taaaaacaag 180
 agttaaaaatg cttctaacag tgtggtcac actgcacagg acactggaat tggcattcgg 240
 gggtgtgtct gtccatgtgg ttctgttgta tgtcatgtgc tctcagctca gacagagaca 300
 tccaattgac ttctgacttg gggcattt 328

<210> 232
 <211> 595
 <212> DNA
 <213> Homo sapien

<400> 232
 cgccaatttt agcaaataag agattgtaaa agaagcagat tgaatgaaga attttttagct 60
 gtgcagatag gtgatgttgg gatggaaaat gctaatacaac taccctttct tttatcaagt 120
 aattaaaata aatctacata aagaaccaa aaggctgttt tataaaagtg aaatatccag 180
 tatttcagag ggccaggcaa gagcacttca gatgaggcag tcaaaatcat tttttccag 240
 tgaggataga ccacaagtgg gtggtgagac cattgaaagc ctttatcaac tgaagagtcc 300
 atttaacagc ataatttgtg ggaagactgg aatagggctg aataaatgtg tttgaatctc 360
 taattttata ctttcttttc ctgagggaact tgatttttct gtccctggat cgccttgtca 420
 taattgggtc tgttcctttt actaccactc ttgagtccat atatgaaatc attaaagttg 480

gatgatcagt	tttttataaa	aatatatatt	tttgtccaag	aaaaaaaaa	gcatacatat	540
gtgattatgg	ctaaatcaaa	ggtaactgga	atgtatatac	ttttgcta	gttcc	595

<210> 233
 <211> 600
 <212> DNA
 <213> Homo sapien

<400> 233						
atgaaggtaa	actctaaaat	cttcataggt	caacaaagaa	aattttatcct	tcacacttat	60
ttctagaaag	cagcagggct	tatttcctag	attgcttaca	atgaagctag	aatatctgcg	120
ataactgtag	agtttcaaaa	aggatcccta	gggctacttc	tacgttctcc	ttaccagttg	180
agcactctcc	ataattttcca	gacgggtcat	gggggagaat	gatagaaatg	agcgtgggaa	240
gaaagacaat	gaaattagaa	atgggtgaga	cacatgggtg	tagaatgcta	agagcagggg	300
tcaggacaat	caaccaggtg	tctaggaagg	gtcaagtcac	cagtgtcatc	tgctgaccaa	360
tgtaggaag	aaataaaactc	aaaggaaaca	ccacattttt	ccaattaaac	tcaaattctat	420
tgacttggtg	tggttctttg	atgttggtgg	gactgctata	acagaaacca	attggatttt	480
caagggcaag	aaactttgcc	actgaataag	atgatgtcat	ccttcctgat	aacaaatagg	540
aatgggtggt	cagctctaaa	cagcgtggac	tgaggaggtt	gcttttctac	aatattactt	600

<210> 234
 <211> 500
 <212> DNA
 <213> Homo sapien

<400> 234						
aaattcctaa	ttcttttact	atctttctcaa	cttttcccaa	agataaaaata	aatttcacat	60
aatttcagtg	aggggaaatg	gtagttgtaa	aaaactacct	caagtagcaa	tcaccgctgg	120
cagtgttttc	tacttttctg	ttctgcaatt	gcaatcacac	ttccaaaaag	aaaagcaa	180
gtttgctaaa	ccatagacag	acaacctctt	tgtgactgg	attataaggt	ttataatgaa	240
aacttatcaa	atataaaaag	tgctccctct	tgaaaatgtg	tattttattt	gaagttttga	300
gtaagaggtg	agtgtttggc	aattttcaac	actccctca	aaaatctccc	aaagttgcaa	360
aaaagtcagt	ttagtaaaat	tccaagcact	taaatgcttc	attgagggcc	agttgatata	420
cgcaatgcac	taatgtgtaa	aaattaaccg	aatgcaacta	ttttataatg	gagagctctt	480
accttttctt	tccagttttt					500

<210> 235
 <211> 159
 <212> DNA
 <213> Homo sapien

<400> 235						
aaaattttaca	gataaaggca	gttcaatact	gccactgaga	agtacatctc	ttaacatata	60
caacttttcag	gccacagttt	tgaaggtctg	aagtatttaag	ttgggttgat	gaattagtcg	120
gttggcactt	acgaacacat	ttattgcctt	gccatcttt			159

<210> 236
 <211> 254
 <212> DNA
 <213> Homo sapien

<400> 236						
aaataagtga	ataagcgata	tttattatct	gcaaggtttt	tttgtgtgtg	tttttgtttt	60
tattttcaat	atgcaagtta	ggcttaattt	ttttatctaa	tgatcatcat	gaaatgaata	120
agagggctta	agaatttgkc	catttgcatt	cggaaaagaa	tgaccagcaa	aaggtttact	180

aatacctctc cctttgggga tttaatgtct ggtgctgccg cctgagtytc aagaattaaa 240
gctgcaagag gact 254

<210> 237
<211> 591
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(591)
<223> n = A,T,C or G

<400> 237
tttttttttt tttttttttt tttttttcta atttttactt tttctcaagt ttaatgtara 60
catacaaraa aacatcaagc aatgtttatt gkgcaattcc aatcattatt tgcaraatct 120
tggtttaaaag tcagtyttta tagccatttc aactgcttg tttaaacaaa aagcaacaat 180
ctggttatyt acctataaat ttcatggtat ttytttaaac actgaagtac taaaagcact 240
gatgatttgt attataattt ttaaaatatt taaaacctac acagatttca taratcattc 300
cttttataaa ataatcaaaa taatttgatt atytggaaaa aaaaattctt gaaacaragc 360
cctttccagg tatyttcaat ctctgtaaaa ccccaaacc caaacagagt aratgatgaa 420
ataaggattt ctcaagtgcc caagactgtc tgaaatttaa ggttgaaaaa tggactggcg 480
tttttcatgt ttctgngaa ttcanagctt acaggtggca tcaaaactca aatctctggg 540
atggctttac atggctttca ctttgatttg tttcattttc atttgcttct t 591

<210> 238
<211> 252
<212> DNA
<213> Homo sapien

<400> 238
aaatggcttt tgccacatac atagatcttc atgatgtgtg agtghtaattc catgtggata 60
tcagttacca aacattacaa aaaattttat ggcccaaat gaccaacgaa attgttacia 120
tagaatttat ccaattttga tctttttata ttcttctacc acacctggaa acagaccaat 180
agacattttg gggttttata ataggaattt gtataaagca ttactctttt tcaataaatt 240
gttttttaatt tt 252

<210> 239
<211> 153
<212> DNA
<213> Homo sapien

<400> 239
ccacaataaa gtttacttgt aaaatttttag aggccattac tccaattatg ttgcacgtac 60
actcatttga caggcgtgga gactcattgt atgtataaga atattctgac agtgagtgtac 120
ccggagtctc tgggtgtacc tcttaccagt cag 153

<210> 240
<211> 382
<212> DNA
<213> Homo sapien

<400> 240
aaaaaaacca tctaaaagtg gtttttttaaat atatatattt tttccaaagg aagaaatttc 60
ttgctttttac tcagggaaaa aaaaaaatta aggtacattt gagtagaatg atttcatcta 120

aaagagttct	ttcaggagac	atctgtgatt	cactgcattg	tttttatttt	cttctttttc	180
ctcttctttt	ccaacatttc	taccattttc	ctcttcttgg	ttgatatcag	gccactttct	240
tttggttgctt	tcttactgtc	acctgttaaa	ccgcgtttct	ttgtgttagg	ttttgaccgc	300
ttttcttctt	tgtgcactgt	gtcaccaggc	tcctttttgc	caattttgga	ctgttcttta	360
cttacaggag	aaggctctgc	ag				382

<210> 241

<211> 400

<212> DNA

<213> Homo sapien

<400> 241

ggcatgagcc	accgcgccc	gccctatctt	ttactttttat	aaatagagat	gaagtttcac	60
catgttgccc	aggctggtat	cgagctcctg	ggctcaagcg	atcccccaac	cttggccttc	120
caaagtgtcg	ggattacaag	cgcgagccac	cgaaattatt	cttaactagc	aagactaggc	180
tctgacatca	catccttata	gttacatccc	tttaagcagg	gttcagccac	tcactctgca	240
cctggagaac	ttgatggtta	tcctcgaag	tgacagtcct	gcaaatagaca	aaaacactcc	300
aaatctatta	ggttggtgca	aaagtaatta	cgctttttgc	cactgaaagt	aagtcccaca	360
ggaccctgag	ggaaatggga	gggtggggta	tacatagcag			400

<210> 242

<211> 75

<212> DNA

<213> Homo sapien

<400> 242

actcacatat	gcagacctga	cactcaagag	tggctagcta	cacagagtcc	atctaatttt	60
tgcaacttcc	tgtgg					75

<210> 243

<211> 192

<212> DNA

<213> Homo sapien

<400> 243

gctccacatt	tgtagcgaac	actttgactc	caaagagaag	gaggaagaca	aagacaagaa	60
ggaaaagaaa	gacaaggaca	agaaggaagc	ccctgctgac	atgggagcac	atcagggagt	120
ggctgttctg	gggattgccc	ttattgctat	gggggaggag	attggtgcag	agatggcatt	180
acgaaccttt	gg					192

<210> 244

<211> 616

<212> DNA

<213> Homo sapien

<400> 244

aatttttatag	caatatactg	accatttctaa	aaataacaaa	atacatgttg	ctctcaacta	60
catagttaaa	aaaggtagta	aatttcttta	cccaaaatag	aggaggggtg	ggctagtgag	120
ctgctcaaac	atttgttaaca	aataaaaatg	tatctatata	catataatga	tcattgtttc	180
atagcctaaa	atcaccatac	aaaatcta	aataaaaattg	tgtcgtgttc	aggagttggg	240
aagccaacac	attaaattaa	caaagtattt	ttggtatatg	taaataatgg	gatagaatct	300
ctcgaatcag	gattgtccca	gaagttctaa	ggcagatgtc	aatgacatgc	acattgtcca	360
tgttcagtaa	ttttcaaaga	ctagaataaa	ctatgtaa	tattcaatac	aattcaatat	420
tacttaactg	ctaaaaagta	cttcaagatc	ttgcactgcc	ttgagtgagt	ataatcaa	480
tagtaattgg	aaaatagctg	taatagcagg	cactgaagaa	ttctgacaaa	taccaataa	540

ctgtttgttt ttaccaaata aactggtaag atgatatcac aaagggtttt aagttatttt 600
gctatacaag gttttt 616

<210> 245
<211> 165
<212> DNA
<213> Homo sapien

<400> 245
ttggaacagt ggattaaaat ccagaagggg aggggtcatg aagaagaaac caggggagta 60
atttcttacc aaacattacc aagaaatatg ccaagtcaca gagcccagat tatggcccgc 120
taccctgaag gttatagaac actcccaaga aacagcaaga caagg 165

<210> 246
<211> 229
<212> DNA
<213> Homo sapien

<400> 246
tgtactggat ccttccaggt gggggcgact ctcacctgac tattacaata gcctcctaag 60
tggtttccct acttgcaacc ttgcccgat aatatctatc ctccacacag caggcagggc 120
gatcctttaa gaatagaagt tagatcatga aaatgctctg ctctgatccc tgcaaaagct 180
cgccacctcc ttacagtcac cgctgaactc gtagcagagg ttcaggagg 229

<210> 247
<211> 338
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (338)
<223> n = A,T,C or G

<400> 247
ggaaaccgtg tgtacttatt ctggatgatg ccaccagtgc cctggatgca aacagccagt 60
tacaggngga gcagctcctg tacgaaagcc ctgagcggtg ctcccgtca gtgcttctca 120
tcacccagca cctcagcctg gtggagcagg ctgaccacat cctctttctg gaaggaggcg 180
ctatccggga ggggggaacc caccancagc tcatggagaa aaaggggtgc tactgggcca 240
tggngcaggc tcctgcagat gctccagaat gaaagccttc tcagacctgc gactccatc 300
tccctccctt ttcttctctc tgtggtggag aaccacag 338

<210> 248
<211> 177
<212> DNA
<213> Homo sapien

<400> 248
tgaaaacaaa tgaattctca actcctacgg ttcattgtaga gtttagagaa aatttccatc 60
attgtcatca ttgaactgtg aacctgggaa gccagatcat gattaacact gacatcaagt 120
ttcaagttgc agatcaatgc acccagtgtt cagatgaggc aaacttctcc gtgacaa 177

<210> 249
<211> 263
<212> DNA

<213> Homo sapien

<400> 249

aaagtaatga ctttattaat aaatatacat ccatatgatg atgtagatac aaatcatgaa	60
cactactcca ttcccataca cataattgca cacgagtagc tcaagtccat ggacataaaa	120
acatacacag tatctattca gactttttac agcagaggac agcgtgctta ttatcagtta	180
attggttaatt attttctcca aaattacctg tggaaaaaag aaattctgaa aacttaaaag	240
aatcaaagtg atctgattac ttt	263

<210> 250

<211> 333

<212> DNA

<213> Homo sapien

<400> 250

aaaaaaaaca acagcgtaaa tattagccca caagagcagt cctaaacaat cacaattaca	60
ctgtactacc caagaagact gtttattgtg aagcatttac ctttcaaaaa atcattacat	120
ttctatttct tgggtggagca gcacattgtg gagtgtgatt ctttaattctt cattgagttt	180
gtcaatagga cattgatgct ggatagggtg tcttttgttt ttatgcctca gaccatcttg	240
tgagattgtt tgcctatctc ataatacagt tttatgcaga aagggtgaaa ctatgtaaat	300
ggtttttatg gaaattatca gttacaatat ttt	333

<210> 251

<211> 384

<212> DNA

<213> Homo sapien

<400> 251

aaaccatttg tacaaaaactt ctataaattt ttctctctct ttctctctta tgtacaaaaa	60
tatcttaata tatccccgaa ctgggttagga tagatacaaa tagatttttt ataataaaaa	120
attcacaaaa gattggaagc attctataat gaaaatggta gaaaagacag tgtgagggaa	180
gccatgggggt ttgggaatcg ggccctggag gagaagcaga gtttcaaagg gctgagaata	240
gcatagtttc actgtaaacc aatgtctaca gcttattggg gtgggggcta ctgagacgaa	300
agacaccaac tcgtttctag agggctaaga actgcacttt aagaaagggc ggggaggtga	360
agggacccga gcaagaactt tcag	384

<210> 252

<211> 211

<212> DNA

<213> Homo sapien

<400> 252

aaagcagtct gaaaatggga catctgtaga gaaattcatt tccttcttct cctccggatg	60
tggaatggaa gctttgaggg aaggaaaagt aggaaaagag cgggatggga tgggatggga	120
tgggatggga tgggatagga agagaggctg gggaatgggc agagaagggg gtgctgagtg	180
tgctgtgaga tagagcaaga tcacaagaag g	211

<210> 253

<211> 135

<212> DNA

<213> Homo sapien

<400> 253

aaaaattggt tcttgacaag ctgacttggc acttaagtgc acttttttat gaagaaaaag	60
tacaatgaac tgcttttcct caagcaataa ttgtttccaa cttgtctggg aattgtgtgt	120

ctggtaactg gaagg

135

<210> 254
 <211> 361
 <212> DNA
 <213> Homo sapien

<400> 254
 cctgtagccc ctgctacacg ggaggctgaa gtgggaggat cacttgaacc aatgaggggtg 60
 aggttacagt gagcccagat catgccacta ctctacaggc tgggtgataa gagtgaagacc 120
 ctgtatcaaa aaaaagacaa ggaaaaaaaa aactgggccg ttgttttttg cagaatgtct 180
 ctcaatttgg acttttttggg caggaatata atacaagtga taaaaatgct tctttaacat 240
 tagaacctgt ataaaattac cattacagac cttgctattt tacttatagg taaatcactg 300
 tttaaccaagg taagtctttt gggaatttcc aaaaatgaag tccatggaca gttaaaaact 360
 g 361

<210> 255
 <211> 331
 <212> DNA
 <213> Homo sapien

<400> 255
 aaaaaataaa ataatccacc aacgtgattg accttggcga gatcatgttt ctagtctata 60
 cctcagtttc cccatctgta aagtgaggat aatgtcccac cccatgtaac tgtgggtgagg 120
 accaactgca acactgtgcc tgcgagtctc cttggaaaag tgtaagggttc tacacaaatg 180
 gaaagtgatc tgatcacact cagtgtcccc agcccagcct ttcagtgtccc tggccctggg 240
 gtgggggaca atactctcct ccccccttc actagtcttc atgaatagca aggaggccat 300
 aacataattt ggtctaaacc ccttcctttt t 331

<210> 256
 <211> 186
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(186)
 <223> n = A,T,C or G

<400> 256
 cctttgggcc cttgcacttt gacctgcaat ggggccacac cagccttgct tgtgtccacc 60
 tggaaggact gagggaggtt ggcacgaacc atgcctgggc tcaggccggg cccanagcac 120
 ttgaccttgg acgcatctgt cacatcatgc acagggacct tgaaaggact gcctggcact 180
 tgatgg 186

<210> 257
 <211> 255
 <212> DNA
 <213> Homo sapien

<400> 257
 ctgggggtccg tcaccgacct ttgggggaact gggctacggg gaccacaagc ccaagtcttc 60
 cactgcagcc caggaggtaa agactctgga tggcattttc tcagagcagg tcgccatggg 120
 ctactcacac tccttggtga tagcaagaga tgaaagtga actgagaaag agaagatcaa 180
 gaaactgccga gaatacaacc cccgaaccct ctgatgctcc cagagactcc tccgactcca 240

cacctctcgc ggcag

255

<210> 258

<211> 604

<212> DNA

<213> Homo sapien

<400> 258

ctgaatttgc aatggagttt ggtgggtgcaa tccgtattga ttagtttggc atagacagat	60
gcagcagttt agagcaaaat cgagaaaatg attttttttt tcttccttga tttcctggca	120
gaagatatct tacttttttca gcaaaactttt cttttaacac taaagcagcc tagggcaatg	180
ccagatactt agagctttttc tcttgattat aagtagaaat ggggggtgtct gggctagagg	240
tggagggtgg atgtgctgtc gtcacagtct agctggcagc aagcaaggca aaagcagaga	300
ctgctctaga agcggttcca agcagcagag acgtcaggaa aggcacttct tagtaccac	360
ctctatgctt taatagttgc ttgttaagct gcttcattggg ttgagacaaa ctaccagcac	420
ttcaaagagc tcagttctct gctcaactct cttctctagt tacattattt tttttccttc	480
aggagactga ggcaggaaaa tcgcttgaac tcaggaggtc gaggccgcag tgagccaaga	540
tcacaccacc gcactccagc ctgggccttg caaagtgcta ggattacagg aatgagccac	600
cagg	604

<210> 259

<211> 429

<212> DNA

<213> Homo sapien

<400> 259

aaaaatgtct gtatcgagat cttccagttt gaagtcttcc tctctgtgtt cttcccaagg	60
ctctgtggca agctccactg gttctcccgcc tccatcaga accactgact tccacaatcc	120
tggctatccc aagtacctgg gcacccccca cctggaactg tacttgagtg actcacttag	180
aaacttgaac aaagagcggc aattccactt cgctgggtatc aggtcccggc tcaaccacat	240
gctggctatg ctgtcaagga gaacactctt tactgaaaac caccttggcc ttcattctgg	300
caatttcagc agagttaatt tgcttgctgt tagagatgta gcactttatc cttcctatca	360
gtaactgctc cgtgttcaga ctctgggtt cttccagggt tacagtggac atcatcagct	420
tcttgcttt	429

<210> 260

<211> 385

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(385)

<223> n = A,T,C or G

<400> 260

ctgcaacaca tgcagcacca gtctcagcct tctcctcggc agcaactccc tgctgcctct	60
cagataacat ccccatcccc tgccatcggg agccccagc cagcctctca gcagcaccag	120
tcgcaaacac agtctcagac acagactcaa gtattatcgc aggtcagtat tttctgaana	180
cgcataatggc agacggattt gcgtatacca aggagagtgg cataggaggg aaaagcatat	240
gtggctgaaa cctgtaagtt ggtgttggtt atgcagaaat gtgtaacaga tcaaacggctc	300
ctctcaagtg tctattanat aggcaataag aactgcagtg tagctgagta acatctttta	360
gctgactata aatcactttg ttttt	385

<210> 261

<211> 230
 <212> DNA
 <213> Homo sapien

<400> 261
 ctgtactgga tccctccagg tgggggacgac tctcacctga ctattacaat agcctcctaa 60
 gtggtttccc tacttgcaac cttgcccgtg taatatctat cctccacaca gcaggcaggg 120
 cgatccttta agaatagaag ttagatcatg aaaatgctct gctctgatcc ctgcaaaaagc 180
 tcgccacctc cttacagtca ccgctgaact cgtagcagag gttcaggagg 230

<210> 262
 <211> 198
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(198)
 <223> n = A,T,C or G

<400> 262
 atgttaagta aacatgaaat ctatataaca gaacaaaaat tcactcttat gtcaatgtca 60
 gcgtgttaat gtagatctat ttactganac agactctgta gtggcagaga gtggccttgt 120
 taagccagga cctgtttctg caggctgtgg gtagaagcta ggaagtccct ggagtttcac 180
 ccagcttttc catgaatg 198

<210> 263
 <211> 157
 <212> DNA
 <213> Homo sapien

<400> 263
 aaaatatatt tctaaacaga atggggccgac tcagtcacag taactgttga tctccatagt 60
 agagcaaccc acaaagacag aactgatttt tttcccataa tcaggggtga aaaatataca 120
 acttgtttct gaacccaaaac cacaatttct gcagttt 157

<210> 264
 <211> 290
 <212> DNA
 <213> Homo sapien

<400> 264
 ctggctactc caagaccctg gcatgaggct gaggacaact tacaagggct tcaccgaagc 60
 agtggacctt tattttgacc acctgatgtc caggggtggtg ccactccagt acaagcgtgg 120
 gggacctatc attgccgtgc aggtggagaa tgaatatggt tcctataata aagaccccgc 180
 atacatgccc tacgtcaaga aggactgga ggaccgtggc attgtggaac tgctcctgac 240
 ttcagacaac aaggatgggc tgagcaaggg gattgtccag ggagtcttgg 290

<210> 265
 <211> 234
 <212> DNA
 <213> Homo sapien

<400> 265
 aaaaaaagga aaggaaagag aggaaaagaa aataaaataa gacgatttat tgcttctcct 60

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cagcatcctc cttggtctcc tccctcaccg agagagcttc tagcttttcc gccacttttt      120
cggcatgatac atttttgcct gatcctttct tttctctctc ttcgatctct ttctctgcatt      180
cttcaaactt tgttttgaat ttctgtgcat tctcagcatt caggaagcgg atgg              234

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<210> 266
<211> 335
<212> DNA
<213> Homo sapien

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<400> 266
gtcctcatca tcccagtttg aggcagtgcg ggagtgggga aggccgtctt agaccataga      60
ggttggaaga cgctgagaga tcatccagcc cagccccctg atgttacaga gcagaagaca      120
gatgccc aaa caggagaagg cacttgccca cggtcatacg gcaggttgcc acaaaaccaa      180
gatggcagcc cttcctcagc gtgcctcact gccactccca gagccagggg gccccataaa      240
acccacatca tgtcttaaga gtatatctgg ctcccttgacc agcaatcggc cctgggagcc      300
accagggtggg aaaagcgcct ctgccagagt ccagg                                335

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<210> 267
<211> 619
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(619)
<223> n = A,T,C or G

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<400> 267
tggagctctg acgaagggat cggggagggtg ctggagaagg aagactgcat gcaggccctg      60
agcggccana tcttcatggg catggngtcc tcccagtagc agggccggct ggacatcgng      120
cgctcatttg atgggcttgt caacgcctgc atccgctttg tctacttctc tttggaggat      180
gagctcaaaa gcaagggtgtt tgcanaaaaa atgggccttg agacaggctg gaactgccac      240
atctccctca caccatgg tgacatgcct ggctccgaga tccccccctc cagccccagc      300
cacgcaggct cctgcatga tgacctgaat cagggtgtccc gagatgatgc anaagggtc      360
ctcctcatgg aggaggaggg ccactcggac ctcatcagct tccagcctac ggacagcgac      420
atccccagct tctggagga ctccaaccgg gccaaagctgc cccgggggtat ccaccaagtg      480
cggccccacc tgcagaacat tgacaacgtg cccctgctag tgcccccttt caccgactgc      540
acccanaga ccatgtgtga gatgataaag atcatgcaan agtacgggga ggtgacctgc      600
tgctgggca nctctgcca                                619

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<210> 268
<211> 147
<212> DNA
<213> Homo sapien

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```

<400> 268
cctataaccc agacaccagc atggacaaaa ctgagttata ctgaattcag agacaaaatt      60
cagtgcactc cttctaccac ttatttaggg ttctacagca tttcactgag cagacttagt      120
tttttgtttt tgttttataa acctttt                                147

```

```

<210> 269
<211> 325
<212> DNA
<213> Homo sapien

```

<400> 269
 ctgagctgta ggaatgggtt cttggtacac aagatagtat tgttgagcta gttttcgagc 60
 tctgtgcaca agcactctgt aatcggggcc catgccactg tacaccaaac ctatatgctt 120
 ggtaattggg tctactttgt gtacacttcg ctcatacatc agaatggatt tctgtttttt 180
 ctcagttgct aataccacac catttgcagc tttaattccc acggacgggg ctcctccagc 240
 tacagcagcc aaagcatatt caatctggac aagtttacca gacgggctga atgtagtcag 300
 cgaaaagctg taccgcgct ccgcc 325

<210> 270
 <211> 428
 <212> DNA
 <213> Homo sapien

<400> 270
 aaacatatgg taaattaccg agtgacacct ctgggctaga gacctctttt gaggggagtt 60
 tgcaaaactac ggattcaatt tctttaacag ttatgaagtt ctttaaagaa cctgtttggg 120
 attggggggg tgtggtcacc tgtgcttttc tgagatttgg cccctacatc taagttgttg 180
 aatgcatgtg tgtagagttg tttatgggtc tcccccttct tcttagaagg gtctatagta 240
 atatccccct ccttatccct agtagtacta atttgtgttt tcttacttct tgacaggcaa 300
 acacatcaga gcataagtgg ttcctaagtc caagctgacc tcccttgatc tctgtcttct 360
 acaggatatt gacatgggac ttctttatta ccttttcagt tcaactgatac cttcaaatag 420
 ctttat 428

<210> 271
 <211> 206
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(206)
 <223> n = A,T,C or G

<400> 271
 cgtccccggag ccacaggnng ncatggctgg canagcgctc tgcattgctg ggctgggtcct 60
 ggcttctgtg tctccagct ctgctgagga gtacgtgggc ctgtctgcaa accagtngc 120
 cgtgccagcc aaggacaggg tggactgcgg ctacccccat gtcaccccca aggagtgc 180
 caaccggggc tgctgctttg actcca 206

<210> 272
 <211> 83
 <212> DNA
 <213> Homo sapien

<400> 272
 ctggcttccc tgagaactca acaatgcctt ttcttgaggg ctttctctga tcattccaaa 60
 tgactacagc cctctctacc tgg 83

<210> 273
 <211> 472
 <212> DNA
 <213> Homo sapien

<400> 273
 ctggagaagg tgtgcagggg aaacctgct gatgtcaccg aggccagggt gtctttctac 60

```

tcgggacact cttccttttg gatgtactgc atggtgttct tggcgctgta tgtgcaggca      120
cgactctgtt ggaagtgggc acggctgctg cgaccacag tccagttctt cctgggtggcc      180
tttgccctct acgtgggcta caccgcgtg tctgattaca aacaccactg gagcgatgtc      240
cttgttggcc tcctgcaggg ggcactggtg gctgccctca ctgtctgcta catctcagac      300
ttcttcaaag cccgaccccc acagcactgt ctgaaggagg aggagctgga acggaagccc      360
agcctgtcac tgacgttgac cctgggagag gctgaccaca accactatgg ataccgcac      420
tcctcctcct gaggccggac cccgccagg caggagctg ctgtgagtcc ag      472

```

```

<210> 274
<211> 205
<212> DNA
<213> Homo sapien

```

```

<400> 274
ccaggcggcc cgaggactta cggtcggcac ttctctgttc tcccgtgtca gcgtgtggtg      60
tcgcctgcat gggctgtacc tggatggtgt gtccaccatc gacacggagg ggctggattt      120
gtttctcagg caatcctgta ttttaatttt agatgtattt cctgaagcat atttttcata      180
gaatgtagcg tgtaaatagc ttttt      205

```

```

<210> 275
<211> 308
<212> DNA
<213> Homo sapien

```

```

<400> 275
ctcctcgccc tccccaccga catcatgttc cagttccagc ttggatttac actgggcaac      60
gtggttgtaa tgtatctggc tcagaactat gatataccaa acctggctaa aaaacttgaa      120
gaaattaaaa aggacttgga tgccaagaag aaaccccccta gtgcatgaga ctgcctccag      180
cactgccttc aggatatact gattctactg ctcttgaggg cctcgtttac tatctgaacc      240
aaaagctttt gttttcgtct ccagcctcag cacttctctt ctttgctaga ccctgtgttt      300
tttgcttt      308

```

```

<210> 276
<211> 201
<212> DNA
<213> Homo sapien

```

```

<400> 276
aaattaactt tttcttgcaa aatattcatt tcattttttc caagaaaatc ttataaaggc      60
aaaaataaaa ttttattttg gcaaagtca tgaagtcgat actggcagca tatggagtta      120
gttaaaaata gacaacaact gctagatata ttcaaaattc tatttttttt tctgagcata      180
gtcaaagaga aattttcatt t      201

```

```

<210> 277
<211> 520
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(520)
<223> n = A,T,C or G

```

```

<400> 277
aaaaaaaaag tattcagcac catttgctca tnggtctttc agagtttggt cttaaagttt      60

```

ctggaacttt	cctgtctgta	aagtaacagg	aattactgag	ctacattgga	aagcctctct	120
gggacaggca	gtggggagtt	aagcagtcac	cataaaggaa	tcagtgtaca	ttcagcatgg	180
tgacttgact	acacaacaat	cccttccccct	ctactgtagc	tcaagagaga	catgcttcta	240
accactgagg	tatgaggagt	ctcagactgt	tatttgctgt	tagaattggg	cttcccagct	300
aataacagta	catctctggc	acagatgcta	ttggtcctta	atgtcctgtg	attttaggaa	360
atagtttgga	tttagttcaa	tttattcaga	aaccaaactg	gtttaattag	cttcactact	420
ctggcagagt	aaggggatgc	tggtttagta	tctttataaa	atatatataa	tgtataggta	480
aatcatagtc	ttaaatcata	cctaaaatac	tgtatcattt			520

<210> 278

<211> 264

<212> DNA

<213> Homo sapien

<400> 278

cgcgccgggc	ggaactttcc	agaacgctcg	gtgagaggcg	gaggagcggt	aactaccccg	60
gctgcgcaca	gctcggcgct	ccttcccgcct	ccctcacaca	ccggcctcag	cccgcaccgg	120
cagtagaaga	tgggtgaaaga	aacaacttac	tacgatgttt	tgggggtcaa	acccaatgct	180
actcaggaag	aattgaaaaa	ggcttatagg	aaactggcct	tgaagtacca	tcctgataag	240
aacccaaatg	aaggagagaa	gttt				264

<210> 279

<211> 414

<212> DNA

<213> Homo sapien

<400> 279

aaacatacaa	taattttttat	tatggaaatt	aatcttttaca	tacaaaatca	gctacgtaat	60
tttacttaca	aaacaataaa	aactgttctt	tactgtggca	acaaaagaag	catttttgaca	120
aatgaaaaaa	attaatgcaa	acaaattaaa	acaatgcttt	tctttttact	tgcttcactg	180
tctcttctat	ttattttcta	tgatcatttg	acacaaacat	ggattacttt	gatattctact	240
gaaacataaa	tgataagggt	cttaaagggt	gaattaaaag	tctgggtggt	caatatttta	300
gaagctgaat	aaacaaaacg	aaattggggg	ttgtgattac	agaggattta	tcattttttc	360
cctttgtcca	tatgaaaata	tataatagaa	aattaccac	gggaaaacat	tttt	414

<210> 280

<211> 262

<212> DNA

<213> Homo sapien

<400> 280

ccaccatgcc	tggcctgctt	caattttttg	atgccacttt	gtaaacggca	cttaattatg	60
gaaaatagga	aaaagcaaaa	ctaaaataag	gaagaggata	tatatataac	ttttcacaat	120
ctcttttctg	atccccctta	gatgccagc	caaccaggac	cacacacaga	tttcatttta	180
tttgtagagt	atatgaaaag	atttaatagt	ctcatgcatt	ttattttacg	tatactgatt	240
tctacgtttt	gactgactat	tt				262

<210> 281

<211> 349

<212> DNA

<213> Homo sapien

<400> 281

ctgtgacccg	ggtgcatcag	tggatatagt	tgtgtctccc	catggggggt	taacagtcct	60
tgcccaagac	cgtttttctga	taatggctgc	agaaatggaa	cagtcacctg	gcacaggccc	120

```

agcagaatta actcagtttt ggaaagaagt tcccagaaac aaagtgatgg aacatagggt 180
aagatgccat actgttgaaa gcagtaaacc aaacactctt acgttaaaag acaatgcttt 240
caatatgtca gataaaacca gtgaagatat atgtctacaa ctcagtcgtt tactagaaag 300
caataggaag cttgaagacc aagttcagcg ttgtatctgg ttccagcag 349

```

```

<210> 282
<211> 381
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(381)
<223> n = A,T,C or G

```

```

<400> 282
aaacactaaa tgaagcttct cacaatttct aattataaac aaaaggctga aaacagtatg 60
ggaaacaaag tttcaaaaca aagaaaagt gagtaaaagg tgccccctct atggctcatc 120
tgaaagaaac attttactca gagaggcaaa catttctgat ctaggagtaa gtttccact 180
cactttgcaa ggaccactc attctgcana aagacctaca agtctttctg gtctcaattg 240
caaagtacgt gaaaatgtgt atgaaagatc taaaagctaa atattagaat aaggctaatt 300
gaaatcaaaa ttgtgtgctg gtctaaatat acatcttcgg cttcttcctt tttagtaagt 360
atttttattt cagatgtatt t 381

```

```

<210> 283
<211> 543
<212> DNA
<213> Homo sapien

```

```

<400> 283
aatatagctc ctccctaccc ccaacaatgg accctgccca ttgcctccca gttccttgat 60
cttcctaggt tccacaactc tctttttcct tttagtttta ttccctccag ccaaacctct 120
cttattcaat attttgagcc aatgggggag ttatgtagat ttttttcctt acacattagc 180
tgcccccttt tatgaccaat gactcataag gcaagatgtg tgggtggcatc ttcggacagg 240
cagcaggctt taatagggca gcctgggttg gtggaggcaa gcaaagctaa ttggcatgcg 300
tgggaatcaa accccaggcc ctgggctcat tagcccatgg tcaaaacaac tgagccagag 360
gaggtaataa tttgcccaag aatatcagta gttcctttat tagaagaaaa tggctgatat 420
ggaagtggg gaatctgaat tgccagagaa tcttgggaag agtaataagc tcttagtctc 480
aacaaaaagt gttttttcat ctcagcgcgt aaagggtgct atatgggaac aaagaagtat 540
ttt 543

```

```

<210> 284
<211> 147
<212> DNA
<213> Homo sapien

```

```

<400> 284
aaactgggtat tttatctttg attctccttc agccctcacc cctggttctc atctttcttg 60
atcaacatct tttcttgctt ctgtccctt ctctcatctc ttagctcccc tccaacctgg 120
ggggcagtggt tgtggagaag ccacagg 147

```

```

<210> 285
<211> 316
<212> DNA
<213> Homo sapien

```

<400> 285
 cggccgaggt ctggcttcac tctactccc tctctgctcg cagcacgtcg gccgccagct 60
 ctttgatgtg ttcccaggcc cgctgcacat gggcagattc caccgtgcga gaacagatgg 120
 caaagcgag gacaaacttg tccctgaggt gacatggaac caagtggatt tttttggcac 180
 tgtttattct ttgcagaaga gcttcattca ctttgttgga acccttttagc cgaaagcaga 240
 caagccccag aatgacttcc acacagattt caaagcgggg atcctggcgc accagtgact 300
 caaactcatg ggacag 316

<210> 286
 <211> 322
 <212> DNA
 <213> Homo sapien

<400> 286
 cctggggagc ccttttagtgg ggtgggacct caggcagacc cccaaaccaa agggagccag 60
 atgccccagt tcaagtcatt agtgatatgt ggcagggctg acagagaaat aatcctggag 120
 gtctccaaag ctgctgggaa tggaatggcg atgaaaagcg caggagtggg cagggtgtgg 180
 tgggtgatgg tggcctcact cagagtggac caaggcccca gtccttgcc caaaaccaa 240
 gcccttgggc ccgaagtgtt tagcataaca tcctttgcag taaatctcgc catccttgtc 300
 tgccaggggtg gttgactcaa gg 322

<210> 287
 <211> 364
 <212> DNA
 <213> Homo sapien

<400> 287
 ctgcccacgc tcaaaccaat tctggctgat atcgagtacc tgcaggacca gcacctctg 60
 ctcacagtca agtccatgga tggctatgaa tcctatgggg agtgtgtggt tgcactcaaa 120
 tccatgatcg gcagcacggc ccaacagttc ctgaccttcc tatcccaccg tggcgaggag 180
 acaggcaata tcagaggctc catgaagggtg cgggtgcccc cggagcgctt gggcaccctg 240
 gagcggctct acgagtggat cagcattgat aaggatgagg caggagcaaa gagcaaagcc 300
 ccctctgtgt cccgagggag ccaggagccc aggtcagggg gccgcaagcc agccttcaca 360
 gagg 364

<210> 288
 <211> 261
 <212> DNA
 <213> Homo sapien

<400> 288
 aaaattataa ctactcattc tttcttttagc cttagttaat ttgagcagaa gccacaacaa 60
 gcaaaccaca ataaatttag aattggcaga aatccacatt aactcctctt cccaagtttc 120
 cacactacta ccattttacag ttgtaggttt gtaatgtata attatgtaat gcagaaacta 180
 gctttgactt gtgtaacgat gcactgtcaa agtaagcaaa gtaagaattg aaattccaca 240
 ttcccagaat ttaacactca g 261

<210> 289
 <211> 261
 <212> DNA
 <213> Homo sapien

<400> 289
 ctgagtgtta aattctggga atgtggaatt tcaattctta ctttgcttac tttgacagtg 60

catcggtaca caagtcaaag ctagtttctg cattacataa ttatacatta caaacctaca	120
actgtaaagt gtagtagtgt ggaaacttgg gaagaggagt taatgtggat ttctgccaat	180
tctaaattta ttgtgggttg cttgttggg cttctgctca aattaactaa ggctaaagaa	240
agaatgagta gttataattt t	261

<210> 290

<211> 92

<212> DNA

<213> Homo sapien

<400> 290

ccactacccg aacttacagg tgccaaaaga agaaagggtg taaacggaga ccacctatca	60
ctcatcagaa cctaggatca tcacattcct tt	92

<210> 291

<211> 287

<212> DNA

<213> Homo sapien

<400> 291

ccatggctcc gctcagggcc ccggtcacct ccgagtcact ctgttccttg actgtctttg	60
tgtttctgta cctcaaggca ctgaagctgg aggactctgt ccatgcctgt gtcaccctcg	120
tgtgggagcc tctgggctcg gcagggtccac atttcatgag ctgaggcgtg ggccagggcc	180
atctggaaaag ggaactcggc ttttccagaa cgtgggtggat catctgtcgg gtgtgtgggtg	240
aacacgttca gttcatcagg gcctacgctc cggaaggagg ccccccag	287

<210> 292

<211> 270

<212> DNA

<213> Homo sapien

<400> 292

ccattgtttc ctgctggcg aaggctcctt gaacatccct caccttcctc tcccgcctct	60
gccttctgct gggcctcagg tggccttttc tctccagcct tgaattgttc cctgttggct	120
tcccaagggc ccatctgctg gtacagtcca cacttcacac gccaaagacc gagagggctt	180
tactgcccc aagcctctct cctgtgaccc tgggattctg tcttggcaga atcctttgtc	240
agcggctctt actctgtcct tctgttttg	270

<210> 293

<211> 333

<212> DNA

<213> Homo sapien

<400> 293

ccatgctcgt caacctgggtg tccactgctt gctacgtctc cttcctcttc ctgggctgcg	60
acactggccc tgtggctggg gttactgttc cctatggaaa cagcacagca cctggctcag	120
ccctggaccc ctactcgccc tgcaataata actgtgaatg ccaaaccgat tcttcaactc	180
cagtgtgtgg ggcagatggc atcacctacc tgtctgcctg ctttgctggc tgcaacagca	240
cgaatctcac gggctgtgcy tgcctcacca ccgtccctgc tgagaacgca accgtgggtc	300
ctggaaaatg cccagtcct gggtgccaag agg	333

<210> 294

<211> 123

<212> DNA

<213> Homo sapien

<400> 294
 ctgatacaaa tacagaaaac tctgcccatt atccaagaaa caaataatta agactaaaat 60
 gcaagctgat gtgttcgagc attgtagggc cactaaatag ccatctgtga ttcgtggcaa 120
 ttt 123

<210> 295
 <211> 311
 <212> DNA
 <213> Homo sapien

<400> 295
 ctgcatacag acatttgttt aggtcatctg gattatcttg attgtcacca tggcaactat 60
 ccacaaccag tgcctagggtg tgtgagaaga gtgatacaat aatactgtgg catggtcatt 120
 tagctaatacc agtctaagcc taacagaaaac cttttccatc aaagtttttc agagaataac 180
 aacatctcat aagaggccag aggatggctt gtgcttaata tcacacctgt acagtagggc 240
 agtgcttccc aggctgtctg cttacatttt agcttgtctt acggttacat atgggttttag 300
 tattttcatt t 311

<210> 296
 <211> 241
 <212> DNA
 <213> Homo sapien

<400> 296
 ctgcggaaga tctgcaacca ccctacatg ttccagcaca tcgaggagtc cttttccgag 60
 cacttggggt tcactggcgg cattgtccaa gggctggacc tgtaccgagc ctccgggtaaa 120
 tttgagcttc ttgatagaat tcttcccaaa ctccgagcaa ccaaccacaa agtgctgctg 180
 ttctgcaaaa tgacctccct catgaccatc atggaagatt actttgcgta tcgcggcttt 240
 a 241

<210> 297
 <211> 295
 <212> DNA
 <213> Homo sapien

<400> 297
 aaacacaaga tgaaaatact ctgttctgtc caaagcatca cctaattggtg tgaggcatct 60
 cacttagctg tggagaagtc cttggaatta gatctcagaa agacagcttt aagacagtaa 120
 aaccttttgg caatgggcta attgccttaa aagaagagtt ctacctgaaa gaccttgag 180
 gtggagaaaat tgtcctacaa agattcttgg atatgttagt ggagataact gacatgggta 240
 gctgtgggtc aaccaggaac tgtcaacaac ctgatctctg caaaaccagg atgga 295

<210> 298
 <211> 347
 <212> DNA
 <213> Homo sapien

<400> 298
 ccaaaaataaa gcttcaggca agaggcaaag atccagtggg atatggggaga atgggtggagg 60
 accaacacct gctacccag agagcttttc taaaaaaagc aagaaagcag tcatgagtgg 120
 tattcacctc gcagaagaca cggaaggtac tgagtgtgag ccagagggac ttccagaagt 180
 tgtaaagaaa gggtttgctg acatcccagc aggaagagct agcccatata tcctgcgaag 240
 aacaaccatg gcaactcggg ccagcccccg cctggctgca cagaagttag cgctatcccc 300
 actgagtctc ggcaaagaaa atcttgacga gtcctccaaa ccaacag 347

<210> 299
 <211> 268
 <212> DNA
 <213> Homo sapien

<400> 299
 aaaaagtaaa catgaaaaca tcacgaattg taccatgatt caagaataac ttttgtaata 60
 gaaaacacat gaccttttgc agtatagtgt gataccgaag taaaagtgaa agaaataaat 120
 gcaggaaagt ttaagtggat gtaagttttt ataaggaaag taataagagg aggctgcttt 180
 tgaaggctct ttgatcttcc atgatgataa tatcgttgca aagttcttta acttgatttc 240
 aagtaattag cagttgacca cttgggttt 268

<210> 300
 <211> 185
 <212> DNA
 <213> Homo sapien

<400> 300
 aaattggaga aggaagtttt cctgaagagc cagaatcctt gctaagtcatt ttagatccaa 60
 ctgaccatct ttatttctgt caaaaatctt catcatgggt cgggtgtatt cttccagttt 120
 agcctcagaa atggcctttc tgtggtgaag aaagaggtct cggaggaagt tgcggagctc 180
 agcag 185

<210> 301
 <211> 75
 <212> DNA
 <213> Homo sapien

<400> 301
 aaaattggaa agtgggataa gaaatctaaa gtaaccagct tatctttgaa acaatattat 60
 ttgaaattg gcttt 75

<210> 302
 <211> 247
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(247)
 <223> n = A,T,C or G

<400> 302
 ccatgttctc tgaattgggt gcagaagaca agggcagagt ggctgcggcc cctattacct 60
 ttgtagcagc cacatcagaa agcagaagaa aacagtattt ctgaaggcat tgtttgaggt 120
 tgatctcagc actgaacgat ttcaagccct acgcaccana acagaaggag ggtggaggaa 180
 gtgatcanag ggaacgagct gtaggtttgc anaaatgtgt gaaaccaaaa tgatcactgc 240
 ctacttg 247

<210> 303
 <211> 535
 <212> DNA
 <213> Homo sapien

<400> 303

ctgcttcaga	ggaaatcact	gaaaaataaa	gaaaaaccat	ccatgcatgg	ctgcatccag	60
tgtacctgta	atcctgaaga	aaagggtccta	attccttcca	tgctgaaatg	ctagcttttg	120
tttcagagag	agactttatt	gcaactgtga	ccaccgtcac	tggtgagcac	tgctgttcgg	180
ccccagcgg	acttaaaaga	ctggaatgtg	gtagtggcgg	tcgttctcgg	tcagcaggga	240
gatctccggc	cagtcctga	gaggctcctc	tgggtagcag	acttcaaagt	ctctggagtt	300
aaacttgaac	agtctgaaca	cttttatctt	tacttcaagg	gagtatccaa	gtataaacat	360
atcaatctgc	tctagtccac	atgtgtcgcc	tacagaattc	aggtgattca	tcataagct	420
caaaggatca	gaggatgtct	ccctggaaaa	caggagtcta	aaaagactgg	gaatgacctt	480
tttagtcttc	atttgttcat	aaacttcagt	gacttgatac	agcatgatga	acttt	535

<210> 304

<211> 522

<212> DNA

<213> Homo sapien

<400> 304

ccgcgctcgg	tctacaatca	cgttttatta	ttggctcgtc	tagtcatggg	atagagaagg	60
taaatagcaa	aatagaaaga	aaagggggaa	aaggtagaag	gcaaggggaa	aactattgg	120
tttagatctt	tatcctggtc	ctgtcaatga	tcaggtaatt	ggaaggatca	aaattaggcc	180
aaacttggtg	attgggccaa	aattgaacca	aagtttgtgt	caagaagacc	tggggcagag	240
atatgtgact	aaatcatttg	gaatatgccc	agaccccaag	aatatttatg	cccaacttga	300
atgctaacca	gaagtccctt	actgtagaag	attgtaaggt	tgctatTTTT	ttgccccgac	360
accaaaatat	tgatgtattt	tccaacacca	attctccaat	tctctgacac	caactcgatg	420
ttcaacaatt	cagtttatatt	ctgtcactaa	ttctctgcagc	tatcagcagg	ccccacaggt	480
aaaggattca	gtctcacaag	attgcccccc	caccacttc	ag		522

<210> 305

<211> 165

<212> DNA

<213> Homo sapien

<400> 305

cctaaagcgc	tcctcgctga	agctcaaggg	gtccacaatg	atttgtttgt	caaagttatt	60
gagtgcata	gccagttctc	ctcctcctcc	accctgggtg	tgtgagggcat	cgtctgaggc	120
agtggcctgg	gctgcattgg	aaatgcctgt	gaccgcctgc	tgag		165

<210> 306

<211> 294

<212> DNA

<213> Homo sapien

<400> 306

ctgcacctaa	gacatggccc	tggctaggcg	ggaacagctc	acagtagcga	tacattcaca	60
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acccacacga	cagagacgtc	actcaagcag	cacagccaca	aatagtttac	agcagctcat	180
gccccgcac	cgccccatg	gggagactcc	ctgaaagggtg	ggcacctgcc	gtctatgagg	240
aggtgtctcc	ctccatcatt	aaccccaaac	cacacaatgt	gtgaggagag	cagg	294

<210> 307

<211> 181

<212> DNA

<213> Homo sapien

<400> 307

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tattgccagc agctataaag tgaacgtact gagaccgaca ggacagcaag aaggcatttg      120
cacatttata tctgacaccc gaccatactt tcagtcacca gaatatcttc tctccagatt      180
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<210> 308
<211> 179
<212> DNA
<213> Homo sapien

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<220>
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<222> (1)...(179)
<223> n = A,T,C or G

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<400> 308
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ggcccgaaga aggcccanct aatcgtgggc tggcgggagc tccacggccc cttcagcca      179

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<210> 309
<211> 129
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(129)
<223> n = A,T,C or G

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<400> 309
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catcaccttc ttcttctctc tctcttctc cccacacctc ttctcttctc tcgtctacct      120
cattgtcag                                                                    129

```

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<210> 310
<211> 390
<212> DNA
<213> Homo sapien

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<400> 310
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gaaccgtggt atgtctgcat gttgcccctt tctcttttcc ctttccctgt cccaccatac      180
gagcacctcc agcctgaaca gaagctctta ctctttccta tttcagtgtt acctgtgtgc      240
ttggtctgtt tgactttacg cccatctcag gacacttcag tagactgttt aggttccccct      300
gtcaaatatc agttaccac tcggtcccag ttttggtgcc ccagaaaggg atgttattat      360
ccttgggggc tcccagggca agggttaagg                                                                    390

```

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<210> 311
<211> 355
<212> DNA
<213> Homo sapien

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<220>

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<221> misc_feature
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 <223> n = A,T,C or G

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 aaaacaaaaa gncaccaatc ttantactgc tgaacttcat ttatgtnacc taacattaac 240
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<210> 312
 <211> 498
 <212> DNA
 <213> Homo sapien

<400> 312
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<210> 313
 <211> 653
 <212> DNA
 <213> Homo sapien

<400> 313
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 tagaatagct ctacccaaa cctcaaaaat aagagcagat agattttaga agcaagaaaa 240
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 ccctcgggtga atgtggtact gtggctcgaa aggaagcaag ggacaggacc caggagactg 600
 ggcggccagg ctctcggagt tccacacaca cctgtgaagc ccggccagca cag 653

<210> 314
 <211> 513
 <212> DNA
 <213> Homo sapien

<400> 314
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 gtcgggtgggg agggcctttt ctccccataa atgcctgaac ttttaatttat accatataag 180

aaatcagtga aaggtaaaca acaagggttaa tgtaactcta ttataaattt tgcatttttt	240
ttctctgtga catatacaag tatatttttg tttttggagc tataaattat ttaatttagc	300
aatcttcaaa gctcataaat ttcaactttt caaataagaa attttaactt caaataagaa	360
gtctaggact ttatggctat taattttact atcaaaatat ccaagggact ccattcaatg	420
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<210> 315

<211> 222

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(222)

<223> n = A,T,C or G

<400> 315

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ttgccttgca aacaggagct ccacaaaagc caggaagaga gactgcctcc ttggctgaaa	180
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<210> 316

<211> 1633

<212> DNA

<213> Homo sapiens

<400> 316

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<210> 317

<211> 4235

<212> DNA

<213> Homo sapiens

<400> 317

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<210> 318

<211> 3347

<212> DNA

<213> Homo sapiens

<400> 318

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<210> 319

<211> 1814

<212> DNA

<213> Homo sapiens

<400> 319

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<210> 320

<211> 3132

<212> DNA

<213> Homo sapiens

<400> 320

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agcagcttcc cttcctcagc tgtcaccaac tcttcagcg cctccacagg gctttcggac 1860

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<210> 321

<211> 2280

<212> DNA

<213> Homo sapiens

<400> 321

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tcgtttctca tctccttgat gttcctgttg tcttacttgt ttggatttta caaaagattt 240
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<210> 322

<211> 1398

<212> DNA

<213> Homo sapiens

<400> 322

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ctaaccctaaa ggaattgaaa ggaaccactc attcacttct agacgacaaa atgcaaaaaa 180
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<210> 323

<211> 1316

<212> DNA

<213> Homo sapiens

<400> 323

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gtgaaagaag cagtgaagggt ggccattgat gcaggatatc ggcacattga ctgtgcctat 180
gtctatcaga atgaacatga agtgggggaa gccatccaag agaagatcca agagaaggct 240
gtgaagcggg aggacctgtt catcgtcagc aagttgtggc ccactttctt tgagagaccc 300

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<210> 324

<211> 200

<212> PRT

<213> Homo sapiens

<400> 324

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```

```

Ala Phe Phe Val Gln Thr Cys Arg Glu Glu His Lys Lys Lys Asn Pro
          20                      25                      30

```

```

Glu Val Pro Val Asn Phe Ala Glu Phe Ser Lys Lys Cys Ser Glu Arg
          35                      40                      45

```

```

Trp Lys Thr Val Ser Gly Lys Glu Lys Ser Lys Phe Asp Glu Met Ala
          50                      55                      60

```

```

Lys Ala Asp Lys Val Arg Tyr Asp Arg Glu Met Lys Asp Tyr Gly Pro
          65                      70                      75                      80

```

```

Ala Lys Gly Gly Lys Lys Lys Lys Asp Pro Asn Ala Pro Lys Arg Pro
          85                      90                      95

```

```

Pro Ser Gly Phe Phe Leu Phe Cys Ser Glu Phe Arg Pro Lys Ile Lys
          100                     105                     110

```

```

Ser Thr Asn Pro Gly Ile Ser Ile Gly Asp Val Ala Lys Lys Leu Gly
          115                     120                     125

```

```

Glu Met Trp Asn Asn Leu Asn Asp Ser Glu Lys Gln Pro Tyr Ile Thr
          130                     135                     140

```

```

Lys Ala Ala Lys Leu Lys Glu Lys Tyr Glu Lys Asp Val Ala Asp Tyr
          145                     150                     155                     160

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Lys Ser Lys Gly Lys Phe Asp Gly Ala Lys Gly Pro Ala Lys Val Ala

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 Arg Lys Lys Val Glu Glu Glu Asp Glu Glu Gln Glu Glu Glu Glu
 180 185 190
 Glu Glu Glu Glu Glu Glu Asp Glu
 195 200

 <210> 325
 <211> 263
 <212> PRT
 <213> Homo sapiens

 <400> 325
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 20 25 30
 Ser Ala Thr Val Gly Leu Lys Ser Lys Thr His Ala Val Leu Val Ala
 35 40 45
 Leu Lys Arg Ala Gln Ser Glu Leu Ala Ala His Gln Lys Lys Ile Leu
 50 55 60
 His Val Asp Asn His Ile Gly Ile Ser Ile Ala Gly Leu Thr Ala Asp
 65 70 75 80
 Ala Arg Leu Leu Cys Asn Phe Met Arg Gln Glu Cys Leu Asp Ser Arg
 85 90 95
 Phe Val Phe Asp Arg Pro Leu Pro Val Ser Arg Leu Val Ser Leu Ile
 100 105 110
 Gly Ser Lys Thr Gln Ile Pro Thr Gln Arg Tyr Gly Arg Arg Pro Tyr
 115 120 125
 Gly Val Gly Leu Leu Ile Ala Gly Tyr Asp Asp Met Gly Pro His Ile
 130 135 140
 Phe Gln Thr Cys Pro Ser Ala Asn Tyr Phe Asp Cys Arg Ala Met Ser
 145 150 155 160
 Ile Gly Ala Arg Ser Gln Ser Ala Arg Thr Tyr Leu Glu Arg His Met
 165 170 175
 Ser Glu Phe Met Glu Cys Asn Leu Asn Glu Leu Val Lys His Gly Leu
 180 185 190
 Arg Ala Leu Arg Glu Thr Leu Pro Ala Glu Gln Asp Leu Thr Thr Lys
 195 200 205
 Asn Val Ser Ile Gly Ile Val Gly Lys Asp Leu Glu Phe Thr Ile Tyr

210 215 220
 Asp Asp Asp Asp Val Ser Pro Phe Leu Glu Gly Leu Glu Glu Arg Pro
 225 230 235 240
 Gln Arg Lys Ala Gln Pro Ala Gln Pro Ala Asp Glu Pro Ala Glu Lys
 245 250 255
 Ala Asp Glu Pro Met Glu His
 260

<210> 326
 <211> 539
 <212> PRT
 <213> Homo sapiens

<400> 326
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 35 40 45
 Arg Thr Ser Leu Gly Pro Lys Gly Met Asp Lys Met Ile Gln Asp Gly
 50 55 60
 Lys Gly Asp Val Thr Ile Thr Asn Asp Gly Ala Thr Ile Leu Lys Gln
 65 70 75 80
 Met Gln Val Leu His Pro Ala Ala Arg Met Leu Val Glu Leu Ser Lys
 85 90 95
 Ala Gln Asp Ile Glu Ala Gly Asp Gly Thr Thr Ser Val Val Ile Ile
 100 105 110
 Ala Gly Ser Leu Leu Asp Ser Cys Thr Lys Leu Leu Gln Lys Gly Ile
 115 120 125
 His Pro Thr Ile Ile Ser Glu Ser Phe Gln Lys Ala Leu Glu Lys Gly
 130 135 140
 Ile Glu Ile Leu Thr Asp Met Ser Arg Pro Val Glu Leu Ser Asp Arg
 145 150 155 160
 Glu Thr Leu Leu Asn Ser Ala Thr Thr Ser Leu Asn Ser Lys Val Val
 165 170 175
 Ser Gln Tyr Ser Ser Leu Leu Ser Pro Met Ser Val Asn Ala Val Met
 180 185 190
 Lys Val Ile Asp Pro Ala Thr Ala Thr Ser Val Asp Leu Arg Asp Ile

195	200	205
Lys Ile Val Lys Lys Leu Gly Gly Thr Ile Asp Asp Cys Glu Leu Val		
210	215	220
Glu Gly Leu Val Leu Thr Gln Lys Val Ser Asn Ser Gly Ile Thr Arg		
225	230	235 240
Val Glu Lys Ala Lys Ile Gly Leu Ile Gln Phe Cys Leu Ser Ala Pro		
	245	250 255
Lys Thr Asp Met Asp Asn Gln Ile Val Val Ser Asp Tyr Ala Gln Met		
	260	265 270
Asp Arg Val Leu Arg Glu Glu Arg Ala Tyr Ile Leu Asn Leu Val Lys		
	275	280 285
Gln Ile Lys Lys Thr Gly Cys Asn Val Leu Leu Ile Gln Lys Ser Ile		
	290	295 300
Leu Arg Asp Ala Leu Ser Asp Leu Ala Leu His Phe Leu Asn Lys Met		
305	310	315 320
Lys Ile Met Val Ile Lys Asp Ile Glu Arg Glu Asp Ile Glu Phe Ile		
	325	330 335
Cys Lys Thr Ile Gly Thr Lys Pro Val Ala His Ile Asp Gln Phe Thr		
	340	345 350
Ala Asp Met Leu Gly Ser Ala Glu Leu Ala Glu Glu Val Asn Leu Asn		
	355	360 365
Gly Ser Gly Lys Leu Leu Lys Ile Thr Gly Cys Ala Ser Pro Gly Lys		
	370	375 380
Thr Val Thr Ile Val Val Arg Gly Ser Asn Lys Leu Val Ile Glu Glu		
385	390	395 400
Ala Glu Arg Ser Ile His Asp Ala Leu Cys Val Ile Arg Cys Leu Val		
	405	410 415
Lys Lys Arg Ala Leu Ile Ala Gly Gly Gly Ala Pro Glu Ile Glu Leu		
	420	425 430
Ala Leu Arg Leu Thr Glu Tyr Ser Arg Thr Leu Ser Gly Met Glu Ser		
	435	440 445
Tyr Cys Val Arg Ala Phe Ala Asp Ala Met Glu Val Ile Pro Ser Thr		
	450	455 460
Leu Ala Glu Asn Ala Gly Leu Asn Pro Ile Ser Thr Val Thr Glu Leu		
465	470	475 480
Arg Asn Arg His Ala Gln Gly Glu Lys Thr Ala Gly Ile Asn Val Arg		
	485	490 495

Lys Gly Gly Ile Ser Asn Ile Leu Glu Glu Leu Val Val Gln Pro Leu
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Leu Val Ser Val Ser Ala Leu Thr Leu Ala Thr Glu Thr Val Arg Ser
 515 520 525

Ile Leu Lys Ile Asp Asp Val Val Asn Thr Arg
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<210> 327

<211> 144

<212> PRT

<213> Homo sapiens

<400> 327

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 20 25 30

Glu Leu Lys Thr Asp Tyr Lys Asn Pro Ile Asp Gln Cys Asn Thr Leu
 35 40 45

Asn Pro Leu Val Leu Pro Glu Tyr Leu Ile His Ala Phe Phe Cys Val
 50 55 60

Met Phe Leu Cys Ala Ala Glu Trp Leu Thr Leu Gly Leu Asn Met Pro
 65 70 75 80

Leu Leu Ala Tyr His Ile Trp Arg Tyr Met Ser Arg Pro Val Met Ser
 85 90 95

Gly Pro Gly Leu Tyr Asp Pro Thr Thr Ile Met Asn Ala Asp Ile Leu
 100 105 110

Ala Tyr Cys Gln Lys Glu Gly Trp Cys Lys Leu Ala Phe Tyr Leu Leu
 115 120 125

Ala Phe Phe Tyr Tyr Leu Tyr Gly Met Ile Tyr Val Leu Val Ser Ser
 130 135 140

<210> 328

<211> 138

<212> PRT

<213> Homo sapiens

<400> 328

Met Pro Asn Phe Ser Gly Asn Trp Lys Ile Ile Arg Ser Glu Asn Phe
 5 10 15

Glu Glu Leu Leu Lys Val Leu Gly Val Asn Val Met Leu Arg Lys Ile

20	25	30
Ala Val Ala Ala Ala Ser Lys Pro Ala Val Glu Ile Lys Gln Glu Gly		
35	40	45
Asp Thr Phe Tyr Ile Lys Thr Ser Thr Thr Val Arg Thr Thr Glu Ile		
50	55	60
Asn Phe Lys Val Gly Glu Glu Phe Glu Glu Gln Thr Val Asp Gly Arg		
65	70	75
Pro Cys Lys Ser Leu Val Lys Trp Glu Ser Glu Asn Lys Met Val Cys		
85	90	95
Glu Gln Lys Leu Leu Lys Gly Glu Gly Pro Lys Thr Ser Trp Thr Arg		
100	105	110
Glu Leu Thr Asn Asp Gly Glu Leu Ile Leu Thr Met Thr Ala Asp Asp		
115	120	125
Val Val Cys Thr Arg Val Tyr Val Arg Glu		
130	135	

<210> 329
 <211> 346
 <212> PRT
 <213> Homo sapiens

<400> 329
Met Phe Leu Ser Ile Leu Val Ala Leu Cys Leu Trp Leu His Leu Ala
5 10 15
Leu Gly Val Arg Gly Ala Pro Cys Glu Ala Val Arg Ile Pro Met Cys
20 25 30
Arg His Met Pro Trp Asn Ile Thr Arg Met Pro Asn His Leu His His
35 40 45
Ser Thr Gln Glu Asn Ala Ile Leu Ala Ile Glu Gln Tyr Glu Glu Leu
50 55 60
Val Asp Val Asn Cys Ser Ala Val Leu Arg Phe Phe Phe Cys Ala Met
65 70 75 80
Tyr Ala Pro Ile Cys Thr Leu Glu Phe Leu His Asp Pro Ile Lys Pro
85 90 95
Cys Lys Ser Val Cys Gln Arg Ala Arg Asp Asp Cys Glu Pro Leu Met
100 105 110
Lys Met Tyr Asn His Ser Trp Pro Glu Ser Leu Ala Cys Asp Glu Leu
115 120 125
Pro Val Tyr Asp Arg Gly Val Cys Ile Ser Pro Glu Ala Ile Val Thr

130	135	140
Asp Leu Pro Glu Asp Val Lys Trp Ile Asp Ile Thr Pro Asp Met Met		
145	150	155 160
Val Gln Glu Arg Pro Leu Asp Val Asp Cys Lys Arg Leu Ser Pro Asp		
	165	170 175
Arg Cys Lys Cys Lys Lys Val Lys Pro Thr Leu Ala Thr Tyr Leu Ser		
	180	185 190
Lys Asn Tyr Ser Tyr Val Ile His Ala Lys Ile Lys Ala Val Gln Arg		
	195	200 205
Ser Gly Cys Asn Glu Val Thr Thr Val Val Asp Val Lys Glu Ile Phe		
	210	215 220
Lys Ser Ser Ser Pro Ile Pro Arg Thr Gln Val Pro Leu Ile Thr Asn		
	225	230 235 240
Ser Ser Cys Gln Cys Pro His Ile Leu Pro His Gln Asp Val Leu Ile		
	245	250 255
Met Cys Tyr Glu Trp Arg Ser Arg Met Met Leu Leu Glu Asn Cys Leu		
	260	265 270
Val Glu Lys Trp Arg Asp Gln Leu Ser Lys Arg Ser Ile Gln Trp Glu		
	275	280 285
Glu Arg Leu Gln Glu Gln Arg Arg Thr Val Gln Asp Lys Lys Lys Thr		
	290	295 300
Ala Gly Arg Thr Ser Arg Ser Asn Pro Pro Lys Pro Lys Gly Lys Pro		
	305	310 315 320
Pro Ala Pro Lys Pro Ala Ser Pro Lys Lys Asn Ile Lys Thr Arg Ser		
	325	330 335
Ala Gln Lys Arg Thr Asn Pro Lys Arg Val		
	340	345

<210> 330

<211> 826

<212> PRT

<213> Homo sapiens

<400> 330

Met Glu Gly Ala Gly Gly Ala Asn Asp Lys Lys Lys Ile Ser Ser Glu
5 10 15

Arg Arg Lys Glu Lys Ser Arg Asp Ala Ala Arg Ser Arg Arg Ser Lys
20 25 30

Glu Ser Glu Val Phe Tyr Glu Leu Ala His Gln Leu Pro Leu Pro His

35					40					45						
Asn	Val	Ser	Ser	His	Leu	Asp	Lys	Ala	Ser	Val	Met	Arg	Leu	Thr	Ile	
50					55					60						
Ser	Tyr	Leu	Arg	Val	Arg	Lys	Leu	Leu	Asp	Ala	Gly	Asp	Leu	Asp	Ile	
65					70					75					80	
Glu	Asp	Asp	Met	Lys	Ala	Gln	Met	Asn	Cys	Phe	Tyr	Leu	Lys	Ala	Leu	
85					90					95						
Asp	Gly	Phe	Val	Met	Val	Leu	Thr	Asp	Asp	Gly	Asp	Met	Ile	Tyr	Ile	
100					105					110						
Ser	Asp	Asn	Val	Asn	Lys	Tyr	Met	Gly	Leu	Thr	Gln	Phe	Glu	Leu	Thr	
115					120					125						
Gly	His	Ser	Val	Phe	Asp	Phe	Thr	His	Pro	Cys	Asp	His	Glu	Glu	Met	
130					135					140						
Arg	Glu	Met	Leu	Thr	His	Arg	Asn	Gly	Leu	Val	Lys	Lys	Gly	Lys	Glu	
145					150					155					160	
Gln	Asn	Thr	Gln	Arg	Ser	Phe	Phe	Leu	Arg	Met	Lys	Cys	Thr	Leu	Thr	
165					170					175						
Ser	Arg	Gly	Arg	Thr	Met	Asn	Ile	Lys	Ser	Ala	Thr	Trp	Lys	Val	Leu	
180					185					190						
His	Cys	Thr	Gly	His	Ile	His	Val	Tyr	Asp	Thr	Asn	Ser	Asn	Gln	Pro	
195					200					205						
Gln	Cys	Gly	Tyr	Lys	Lys	Pro	Pro	Met	Thr	Cys	Leu	Val	Leu	Ile	Cys	
210					215					220						
Glu	Pro	Ile	Pro	His	Pro	Ser	Asn	Ile	Glu	Ile	Pro	Leu	Asp	Ser	Lys	
225					230					235					240	
Thr	Phe	Leu	Ser	Arg	His	Ser	Leu	Asp	Met	Lys	Phe	Ser	Tyr	Cys	Asp	
245					250					255						
Glu	Arg	Ile	Thr	Glu	Leu	Met	Gly	Tyr	Glu	Pro	Glu	Glu	Leu	Leu	Gly	
260					265					270						
Arg	Ser	Ile	Tyr	Glu	Tyr	Tyr	His	Ala	Leu	Asp	Ser	Asp	His	Leu	Thr	
275					280					285						
Lys	Thr	His	His	Asp	Met	Phe	Thr	Lys	Gly	Gln	Val	Thr	Thr	Gly	Gln	
290					295					300						
Tyr	Arg	Met	Leu	Ala	Lys	Arg	Gly	Gly	Tyr	Val	Trp	Val	Glu	Thr	Gln	
305					310					315					320	
Ala	Thr	Val	Ile	Tyr	Asn	Thr	Lys	Asn	Ser	Gln	Pro	Gln	Cys	Ile	Val	
325					330					335						

Cys Val Asn Tyr Val Val Ser Gly Ile Ile Gln His Asp Leu Ile Phe
 340 345 350
 Ser Leu Gln Gln Thr Glu Cys Val Leu Lys Pro Val Glu Ser Ser Asp
 355 360 365
 Met Lys Met Thr Gln Leu Phe Thr Lys Val Glu Ser Glu Asp Thr Ser
 370 375 380
 Ser Leu Phe Asp Lys Leu Lys Lys Glu Pro Asp Ala Leu Thr Leu Leu
 385 390 395 400
 Ala Pro Ala Ala Gly Asp Thr Ile Ile Ser Leu Asp Phe Gly Ser Asn
 405 410 415
 Asp Thr Glu Thr Asp Asp Gln Gln Leu Glu Glu Val Pro Leu Tyr Asn
 420 425 430
 Asp Val Met Leu Pro Ser Pro Asn Glu Lys Leu Gln Asn Ile Asn Leu
 435 440 445
 Ala Met Ser Pro Leu Pro Thr Ala Glu Thr Pro Lys Pro Leu Arg Ser
 450 455 460
 Ser Ala Asp Pro Ala Leu Asn Gln Glu Val Ala Leu Lys Leu Glu Pro
 465 470 475 480
 Asn Pro Glu Ser Leu Glu Leu Ser Phe Thr Met Pro Gln Ile Gln Asp
 485 490 495
 Gln Thr Pro Ser Pro Ser Asp Gly Ser Thr Arg Gln Ser Ser Pro Glu
 500 505 510
 Pro Asn Ser Pro Ser Glu Tyr Cys Phe Tyr Val Asp Ser Asp Met Val
 515 520 525
 Asn Glu Phe Lys Leu Glu Leu Val Glu Lys Leu Phe Ala Glu Asp Thr
 530 535 540
 Glu Ala Lys Asn Pro Phe Ser Thr Gln Asp Thr Asp Leu Asp Leu Glu
 545 550 555 560
 Met Leu Ala Pro Tyr Ile Pro Met Asp Asp Asp Phe Gln Leu Arg Ser
 565 570 575
 Phe Asp Gln Leu Ser Pro Leu Glu Ser Ser Ser Ala Ser Pro Glu Ser
 580 585 590
 Ala Ser Pro Gln Ser Thr Val Thr Val Phe Gln Gln Thr Gln Ile Gln
 595 600 605
 Glu Pro Thr Ala Asn Ala Thr Thr Thr Thr Ala Thr Thr Asp Glu Leu
 610 615 620

Lys Thr Val Thr Lys Asp Arg Met Glu Asp Ile Lys Ile Leu Ile Ala
625 630 635 640

Ser Pro Ser Pro Thr His Ile His Lys Glu Thr Thr Ser Ala Thr Ser
645 650 655

Ser Pro Tyr Arg Asp Thr Gln Ser Arg Thr Ala Ser Pro Asn Arg Ala
660 665 670

Gly Lys Gly Val Ile Glu Gln Thr Glu Lys Ser His Pro Arg Ser Pro
675 680 685

Asn Val Leu Ser Val Ala Leu Ser Gln Arg Thr Thr Val Pro Glu Glu
690 695 700

Glu Leu Asn Pro Lys Ile Leu Ala Leu Gln Asn Ala Gln Arg Lys Arg
705 710 715 720

Lys Met Glu His Asp Gly Ser Leu Phe Gln Ala Val Gly Ile Gly Thr
725 730 735

Leu Leu Gln Gln Pro Asp Asp His Ala Ala Thr Thr Ser Leu Ser Trp
740 745 750

Lys Arg Val Lys Gly Cys Lys Ser Ser Glu Gln Asn Gly Met Glu Gln
755 760 765

Lys Thr Ile Ile Leu Ile Pro Ser Asp Leu Ala Cys Arg Leu Leu Gly
770 775 780

Gln Ser Met Asp Glu Ser Gly Leu Pro Gln Leu Thr Ser Tyr Asp Cys
785 790 795 800

Glu Val Asn Ala Pro Ile Gln Gly Ser Arg Asn Leu Leu Gln Gly Glu
805 810 815

Glu Leu Leu Arg Ala Leu Asp Gln Val Asn
820 825

<210> 331

<211> 92

<212> PRT

<213> Homo sapiens

<400> 331

Met Ala Tyr Arg Gly Gln Gly Gln Lys Val Gln Lys Val Met Val Gln
5 10 15

Pro Ile Asn Leu Ile Phe Arg Tyr Leu Gln Asn Arg Ser Arg Ile Gln
20 25 30

Val Trp Leu Tyr Glu Gln Val Asn Met Arg Ile Glu Gly Cys Ile Ile
35 40 45

Gly Phe Asp Glu Tyr Met Asn Leu Val Leu Asp Asp Ala Glu Glu Ile
 50 55 60

His Ser Lys Thr Lys Ser Arg Lys Gln Leu Gly Arg Ile Met Leu Lys
 65 70 75 80

Gly Asp Asn Ile Thr Leu Leu Gln Ser Val Ser Asn
 85 90

<210> 332

<211> 235

<212> PRT

<213> Homo sapiens

<400> 332

Met Asp Pro Ala Arg Pro Leu Gly Leu Ser Ile Leu Leu Leu Phe Leu
 5 10 15

Thr Glu Ala Ala Leu Gly Asp Ala Ala Gln Glu Pro Thr Gly Asn Asn
 20 25 30

Ala Glu Ile Cys Leu Leu Pro Leu Asp Tyr Gly Pro Cys Arg Ala Leu
 35 40 45

Leu Leu Arg Tyr Tyr Tyr Asp Arg Tyr Thr Gln Ser Cys Arg Gln Phe
 50 55 60

Leu Tyr Gly Gly Cys Glu Gly Asn Ala Asn Asn Phe Tyr Thr Trp Glu
 65 70 75 80

Ala Cys Asp Asp Ala Cys Trp Arg Ile Glu Lys Val Pro Lys Val Cys
 85 90 95

Arg Leu Gln Val Ser Val Asp Asp Gln Cys Glu Gly Ser Thr Glu Lys
 100 105 110

Tyr Phe Phe Asn Leu Ser Ser Met Thr Cys Glu Lys Phe Phe Ser Gly
 115 120 125

Gly Cys His Arg Asn Arg Ile Glu Asn Arg Phe Pro Asp Glu Ala Thr
 130 135 140

Cys Met Gly Phe Cys Ala Pro Lys Lys Ile Pro Ser Phe Cys Tyr Ser
 145 150 155 160

Pro Lys Asp Glu Gly Leu Cys Ser Ala Asn Val Thr Arg Tyr Tyr Phe
 165 170 175

Asn Pro Arg Tyr Arg Thr Cys Asp Ala Phe Thr Tyr Thr Gly Cys Gly
 180 185 190

Gly Asn Asp Asn Asn Phe Val Ser Arg Glu Asp Cys Lys Arg Ala Cys
 195 200 205

Ala Lys Ala Leu Lys Lys Lys Lys Lys Met Pro Lys Leu Arg Phe Ala

225 230 235 240
 Asp Lys Lys Gly Phe Tyr Lys Lys Lys Gln Cys Arg Pro Ser Lys Gly
 245 250 255
 Arg Lys Arg Gly Phe Cys Trp Cys Val Asp Lys Tyr Gly Gln Pro Leu
 260 265 270
 Pro Gly Tyr Thr Thr Lys Gly Lys Glu Asp Val His Cys Tyr Ser Met
 275 280 285
 Gln Ser Lys
 290

<210> 334
 <211> 582
 <212> PRT
 <213> Homo sapiens

<400> 334
 Glu Ser Lys Gly Ala Ser Ser Cys Arg Leu Leu Phe Cys Leu Leu Ile
 5 10 15
 Ser Ala Thr Val Phe Arg Pro Gly Leu Gly Trp Tyr Thr Val Asn Ser
 20 25 30
 Ala Tyr Gly Asp Thr Ile Ile Ile Pro Cys Arg Leu Asp Val Pro Gln
 35 40 45
 Asn Leu Met Phe Gly Lys Trp Lys Tyr Glu Lys Pro Asp Gly Ser Pro
 50 55 60
 Val Phe Ile Ala Phe Arg Ser Ser Thr Lys Lys Ser Val Gln Tyr Asp
 65 70 75 80
 Asp Val Pro Glu Tyr Lys Asp Arg Leu Asn Leu Ser Glu Asn Tyr Thr
 85 90 95
 Leu Ser Ile Ser Asn Ala Arg Ile Ser Asp Glu Lys Arg Phe Val Cys
 100 105 110
 Met Leu Val Thr Glu Asp Asn Val Phe Glu Ala Pro Thr Ile Val Lys
 115 120 125
 Val Phe Lys Gln Pro Ser Lys Pro Glu Ile Val Ser Lys Ala Leu Phe
 130 135 140
 Leu Glu Thr Glu Gln Leu Lys Lys Leu Gly Asp Cys Ile Ser Glu Asp
 145 150 155 160
 Ser Tyr Pro Asp Gly Asn Ile Thr Trp Tyr Arg Asn Gly Lys Val Leu
 165 170 175
 His Pro Leu Glu Gly Ala Val Val Ile Ile Phe Lys Lys Glu Met Asp

180	185	190
Pro Val Thr Gln Leu Tyr Thr Met Thr Ser Thr Leu Glu Tyr Lys Thr		
195	200	205
Thr Lys Ala Asp Ile Gln Met Pro Phe Thr Cys Ser Val Thr Tyr Tyr		
210	215	220
Gly Pro Ser Gly Gln Lys Thr Ile His Ser Glu Gln Ala Val Phe Asp		
225	230	235
Ile Tyr Tyr Pro Thr Glu Gln Val Thr Ile Gln Val Leu Pro Pro Lys		
245	250	255
Asn Ala Ile Lys Glu Gly Asp Asn Ile Thr Leu Lys Cys Leu Gly Asn		
260	265	270
Gly Asn Pro Pro Pro Glu Glu Phe Leu Phe Tyr Leu Pro Gly Gln Pro		
275	280	285
Glu Gly Ile Arg Ser Ser Asn Thr Tyr Thr Leu Thr Asp Val Arg Arg		
290	295	300
Asn Ala Thr Gly Asp Tyr Lys Cys Ser Leu Ile Asp Lys Lys Ser Met		
305	310	315
Ile Ala Ser Thr Ala Ile Thr Val His Tyr Leu Asp Leu Ser Leu Asn		
325	330	335
Pro Ser Gly Glu Val Thr Arg Gln Ile Gly Asp Ala Leu Pro Val Ser		
340	345	350
Cys Thr Ile Ser Ala Ser Arg Asn Ala Thr Val Val Trp Met Lys Asp		
355	360	365
Asn Ile Arg Leu Arg Ser Ser Pro Ser Phe Ser Ser Leu His Tyr Gln		
370	375	380
Asp Ala Gly Asn Tyr Val Cys Glu Thr Ala Leu Gln Glu Val Glu Gly		
385	390	395
Leu Lys Lys Arg Glu Ser Leu Thr Leu Ile Val Glu Gly Lys Pro Gln		
405	410	415
Ile Lys Met Thr Lys Lys Thr Asp Pro Ser Gly Leu Ser Lys Thr Ile		
420	425	430
Ile Cys His Val Glu Gly Phe Pro Lys Pro Ala Ile Gln Trp Thr Ile		
435	440	445
Thr Gly Ser Gly Ser Val Ile Asn Gln Thr Glu Glu Ser Pro Tyr Ile		
450	455	460
Asn Gly Arg Tyr Tyr Ser Lys Ile Ile Ile Ser Pro Glu Glu Asn Val		
465	470	475
		480

Thr Leu Thr Cys Thr Ala Glu Asn Gln Leu Glu Arg Thr Val Asn Ser
 485 490 495

Leu Asn Val Ser Ala Ile Ser Ile Pro Glu His Asp Glu Ala Asp Glu
 500 505 510

Ile Ser Asp Glu Asn Arg Glu Lys Val Asn Asp Gln Ala Lys Leu Ile
 515 520 525

Val Gly Ile Val Val Gly Leu Leu Leu Ala Ala Leu Val Ala Gly Val
 530 535 540

Val Tyr Trp Leu Tyr Met Lys Lys Ser Lys Thr Ala Ser Lys His Val
 545 550 555 560

Asn Lys Asp Leu Gly Asn Met Glu Glu Asn Lys Lys Leu Glu Glu Asn
 565 570 575

Asn His Lys Thr Glu Ala
 580

<210> 335

<211> 709

<212> PRT

<213> Homo sapiens

<400> 335

Met Ala Glu Val Glu Asp Gln Ala Ala Arg Asp Met Lys Arg Leu Glu
 5 10 15

Glu Lys Asp Lys Glu Arg Lys Asn Val Lys Gly Ile Arg Asp Asp Ile
 20 25 30

Glu Glu Glu Asp Asp Gln Glu Ala Tyr Phe Arg Tyr Met Ala Glu Asn
 35 40 45

Pro Thr Ala Gly Val Val Gln Glu Glu Glu Glu Asp Asn Leu Glu Tyr
 50 55 60

Asp Ser Asp Gly Asn Pro Ile Ala Pro Thr Lys Lys Ile Ile Asp Pro
 65 70 75 80

Leu Pro Pro Ile Asp His Ser Glu Ile Asp Tyr Pro Pro Phe Glu Lys
 85 90 95

Asn Phe Tyr Asn Glu His Glu Glu Ile Thr Asn Leu Thr Pro Gln Gln
 100 105 110

Leu Ile Asp Leu Arg His Lys Leu Asn Leu Arg Val Ser Gly Ala Ala
 115 120 125

Pro Pro Arg Pro Gly Ser Ser Phe Ala His Phe Gly Phe Asp Glu Gln
 130 135 140

Leu Met His Gln Ile Arg Lys Ser Glu Tyr Thr Gln Pro Thr Pro Ile
 145 150 155 160
 Gln Cys Gln Gly Val Pro Val Ala Leu Ser Gly Arg Asp Met Ile Gly
 165 170 175
 Ile Ala Lys Thr Gly Ser Gly Lys Thr Ala Ala Phe Ile Trp Pro Met
 180 185 190
 Leu Ile His Ile Met Asp Gln Lys Glu Leu Glu Pro Gly Asp Gly Pro
 195 200 205
 Ile Ala Val Ile Val Cys Pro Thr Arg Glu Leu Cys Gln Gln Ile His
 210 215 220
 Ala Glu Cys Lys Arg Phe Gly Lys Ala Tyr Asn Leu Arg Ser Val Ala
 225 230 235 240
 Val Tyr Gly Gly Gly Ser Met Trp Glu Gln Ala Lys Ala Leu Gln Glu
 245 250 255
 Gly Ala Glu Ile Val Val Cys Thr Pro Gly Arg Leu Ile Asp His Val
 260 265 270
 Lys Lys Lys Ala Thr Asn Leu Gln Arg Val Ser Tyr Leu Val Phe Asp
 275 280 285
 Glu Ala Asp Arg Met Phe Asp Met Gly Phe Glu Tyr Gln Val Arg Ser
 290 295 300
 Ile Ala Ser His Val Arg Pro Asp Arg Gln Thr Leu Leu Phe Ser Ala
 305 310 315 320
 Thr Phe Arg Lys Lys Ile Glu Lys Leu Ala Arg Asp Ile Leu Ile Asp
 325 330 335
 Pro Ile Arg Val Val Gln Gly Asp Ile Gly Glu Ala Asn Glu Asp Val
 340 345 350
 Thr Gln Ile Val Glu Ile Leu His Ser Gly Pro Ser Lys Trp Asn Trp
 355 360 365
 Leu Thr Arg Arg Leu Val Glu Phe Thr Ser Ser Gly Ser Val Leu Leu
 370 375 380
 Phe Val Thr Lys Lys Ala Asn Ala Glu Glu Leu Ala Asn Asn Leu Lys
 385 390 395 400
 Gln Glu Gly His Asn Leu Gly Leu Leu His Gly Asp Met Asp Gln Ser
 405 410 415
 Glu Arg Asn Lys Val Ile Ser Asp Phe Lys Lys Lys Asp Ile Pro Val
 420 425 430

Leu Val Ala Thr Asp Val Ala Ala Arg Gly Leu Asp Ile Pro Ser Ile
 435 440 445
 Lys Thr Val Ile Asn Tyr Asp Val Ala Arg Asp Ile Asp Thr His Thr
 450 455 460
 His Arg Ile Gly Arg Thr Gly Arg Ala Gly Glu Lys Gly Val Ala Tyr
 465 470 475 480
 Thr Leu Leu Thr Pro Lys Asp Ser Asn Phe Ala Gly Asp Leu Val Arg
 485 490 495
 Asn Leu Glu Gly Ala Asn Gln His Val Ser Lys Glu Leu Leu Asp Leu
 500 505 510
 Ala Met Gln Asn Ala Trp Phe Arg Lys Ser Arg Phe Lys Gly Gly Lys
 515 520 525
 Gly Lys Lys Leu Asn Ile Gly Gly Gly Gly Leu Gly Tyr Arg Glu Arg
 530 535 540
 Pro Gly Leu Gly Ser Glu Asn Met Asp Arg Gly Asn Asn Asn Val Met
 545 550 555 560
 Ser Asn Tyr Glu Ala Tyr Lys Pro Ser Thr Gly Ala Met Gly Asp Arg
 565 570 575
 Leu Thr Ala Met Lys Ala Ala Phe Gln Ser Gln Tyr Lys Ser His Phe
 580 585 590
 Val Ala Ala Ser Leu Ser Asn Gln Lys Ala Gly Ser Ser Ala Ala Gly
 595 600 605
 Ala Ser Gly Trp Thr Ser Ala Gly Ser Leu Asn Ser Val Pro Thr Asn
 610 615 620
 Ser Ala Gln Gln Gly His Asn Ser Pro Asp Ser Pro Val Thr Ser Ala
 625 630 635 640
 Ala Lys Gly Ile Pro Gly Phe Gly Asn Thr Gly Asn Ile Ser Gly Ala
 645 650 655
 Pro Val Thr Tyr Pro Ser Ala Gly Ala Gln Gly Val Asn Asn Thr Ala
 660 665 670
 Ser Gly Asn Asn Ser Arg Glu Gly Thr Gly Gly Ser Asn Gly Lys Arg
 675 680 685
 Glu Arg Tyr Thr Glu Asn Arg Gly Ser Ser Pro Ser Gln Ser Arg Arg
 690 695 700
 Asp Trp Gln Ser Ala
 705

<210> 336

<211> 480

<212> PRT

<213> Homo sapiens

<400> 336

Met Ile Arg Ala Ala Pro Pro Pro Leu Phe Leu Leu Leu Leu Leu Leu
 5 10 15

Leu Leu Leu Val Ser Trp Ala Ser Arg Gly Glu Ala Ala Pro Asp Gln
 20 25 30

Asp Glu Ile Gln Arg Leu Pro Gly Leu Ala Lys Gln Pro Ser Phe Arg
 35 40 45

Gln Tyr Ser Gly Tyr Leu Lys Ser Ser Gly Ser Lys His Leu His Tyr
 50 55 60

Trp Phe Val Glu Ser Gln Lys Asp Pro Glu Asn Ser Pro Val Val Leu
 65 70 75 80

Trp Leu Asn Gly Gly Pro Gly Cys Ser Ser Leu Asp Gly Leu Leu Thr
 85 90 95

Glu His Gly Pro Phe Leu Val Gln Pro Asp Gly Val Thr Leu Glu Tyr
 100 105 110

Asn Pro Tyr Ser Trp Asn Leu Ile Ala Asn Val Leu Tyr Leu Glu Ser
 115 120 125

Pro Ala Gly Val Gly Phe Ser Tyr Ser Asp Asp Lys Phe Tyr Ala Thr
 130 135 140

Asn Asp Thr Glu Val Ala Gln Ser Asn Phe Glu Ala Leu Gln Asp Phe
 145 150 155 160

Phe Arg Leu Phe Pro Glu Tyr Lys Asn Asn Lys Leu Phe Leu Thr Gly
 165 170 175

Glu Ser Tyr Ala Gly Ile Tyr Ile Pro Thr Leu Ala Val Leu Val Met
 180 185 190

Gln Asp Pro Ser Met Asn Leu Gln Gly Leu Ala Val Gly Asn Gly Leu
 195 200 205

Ser Ser Tyr Glu Gln Asn Asp Asn Ser Leu Val Tyr Phe Ala Tyr Tyr
 210 215 220

His Gly Leu Leu Gly Asn Arg Leu Trp Ser Ser Leu Gln Thr His Cys
 225 230 235 240

Cys Ser Gln Asn Lys Cys Asn Phe Tyr Asp Asn Lys Asp Leu Glu Cys
 245 250 255

Val Thr Asn Leu Gln Glu Val Ala Arg Ile Val Gly Asn Ser Gly Leu

	260		265		270
Asn Ile Tyr	Asn Leu Tyr	Ala Pro Cys	Ala Gly Gly	Val Pro Ser	His
275		280		285	
Phe Arg Tyr	Glu Lys Asp	Thr Val Val	Val Gln Asp	Leu Gly Asn	Ile
290		295		300	
Phe Thr Arg	Leu Pro Leu	Lys Arg Met	Trp His Gln	Ala Leu Leu	Arg
305		310		315	320
Ser Gly Asp	Lys Val Arg	Met Asp Pro	Pro Cys Thr	Asn Thr Thr	Ala
	325		330		335
Ala Ser Thr	Tyr Leu Asn	Asn Pro Tyr	Val Arg Lys	Ala Leu Asn	Ile
	340		345		350
Pro Glu Gln	Leu Pro Gln	Trp Asp Met	Cys Asn Phe	Leu Val Asn	Leu
	355		360		365
Gln Tyr Arg	Arg Leu Tyr	Arg Ser Met	Asn Ser Gln	Tyr Leu Lys	Leu
370		375		380	
Leu Ser Ser	Gln Lys Tyr	Gln Ile Leu	Leu Tyr Asn	Gly Asp Val	Asp
385		390		395	400
Met Ala Cys	Asn Phe Met	Gly Asp Glu	Trp Phe Val	Asp Ser Leu	Asn
	405		410		415
Gln Lys Met	Glu Val Gln	Arg Arg Pro	Trp Leu Val	Lys Tyr Gly	Asp
	420		425		430
Ser Gly Glu	Gln Ile Ala	Gly Phe Val	Lys Glu Phe	Ser His Ile	Ala
	435		440		445
Phe Leu Thr	Ile Lys Gly	Ala Gly His	Met Val Pro	Thr Asp Lys	Pro
450		455		460	
Leu Ala Ala	Phe Thr Met	Phe Ser Arg	Phe Leu Asn	Lys Gln Pro	Tyr
465		470		475	480

<210> 337

<211> 543

<212> PRT

<213> Homo sapiens

<400> 337

Met Ala Ala	Ala Lys Ala	Glu Met Gln	Leu Met Ser	Pro Leu Gln	Ile
	5		10		15

Ser Asp Pro	Phe Gly Ser	Phe Pro His	Ser Pro Thr	Met Asp Asn	Tyr
	20		25		30

Pro Lys Leu Glu Glu Met Met Leu Leu Ser Asn Gly Ala Pro Gln Phe

35	40	45
Leu Gly Ala Ala Gly Ala Pro Glu Gly Ser Gly Ser Asn Ser Ser Ser		
50	55	60
Ser Ser Ser Gly Gly Gly Gly Gly Gly Gly Gly Ser Asn Ser Ser		
65	70	75
Ser Ser Ser Ser Thr Phe Asn Pro Gln Ala Asp Thr Gly Glu Gln Pro		
85	90	95
Tyr Glu His Leu Thr Ala Glu Ser Phe Pro Asp Ile Ser Leu Asn Asn		
100	105	110
Glu Lys Val Leu Val Glu Thr Ser Tyr Pro Ser Gln Thr Thr Arg Leu		
115	120	125
Pro Pro Ile Thr Tyr Thr Gly Arg Phe Ser Leu Glu Pro Ala Pro Asn		
130	135	140
Ser Gly Asn Thr Leu Trp Pro Glu Pro Leu Phe Ser Leu Val Ser Gly		
145	150	155
Leu Val Ser Met Thr Asn Pro Pro Ala Ser Ser Ser Ser Ala Pro Ser		
165	170	175
Pro Ala Ala Ser Ser Ala Ser Ala Ser Gln Ser Pro Pro Leu Ser Cys		
180	185	190
Ala Val Pro Ser Asn Asp Ser Ser Pro Ile Tyr Ser Ala Ala Pro Thr		
195	200	205
Phe Pro Thr Pro Asn Thr Asp Ile Phe Pro Glu Pro Gln Ser Gln Ala		
210	215	220
Phe Pro Gly Ser Ala Gly Thr Ala Leu Gln Tyr Pro Pro Pro Ala Tyr		
225	230	235
Pro Ala Ala Lys Gly Gly Phe Gln Val Pro Met Ile Pro Asp Tyr Leu		
245	250	255
Phe Pro Gln Gln Gln Gly Asp Leu Gly Leu Gly Thr Pro Asp Gln Lys		
260	265	270
Pro Phe Gln Gly Leu Glu Ser Arg Thr Gln Gln Pro Ser Leu Thr Pro		
275	280	285
Leu Ser Thr Ile Lys Ala Phe Ala Thr Gln Ser Gly Ser Gln Asp Leu		
290	295	300
Lys Ala Leu Asn Thr Ser Tyr Gln Ser Gln Leu Ile Lys Pro Ser Arg		
305	310	315
Met Arg Lys Tyr Pro Asn Arg Pro Ser Lys Thr Pro Pro His Glu Arg		
325	330	335

Pro Tyr Ala Cys Pro Val Glu Ser Cys Asp Arg Arg Phe Ser Arg Ser
 340 345 350
 Asp Glu Leu Thr Arg His Ile Arg Ile His Thr Gly Gln Lys Pro Phe
 355 360 365
 Gln Cys Arg Ile Cys Met Arg Asn Phe Ser Arg Ser Asp His Leu Thr
 370 375 380
 Thr His Ile Arg Thr His Thr Gly Glu Lys Pro Phe Ala Cys Asp Ile
 385 390 395 400
 Cys Gly Arg Lys Phe Ala Arg Ser Asp Glu Arg Lys Arg His Thr Lys
 405 410 415
 Ile His Leu Arg Gln Lys Asp Lys Lys Ala Asp Lys Ser Val Val Ala
 420 425 430
 Ser Ser Ala Thr Ser Ser Leu Ser Ser Tyr Pro Ser Pro Val Ala Thr
 435 440 445
 Ser Tyr Pro Ser Pro Val Thr Thr Ser Tyr Pro Ser Pro Ala Thr Thr
 450 455 460
 Ser Tyr Pro Ser Pro Val Pro Thr Ser Phe Ser Ser Pro Gly Ser Ser
 465 470 475 480
 Thr Tyr Pro Ser Pro Val His Ser Gly Phe Pro Ser Pro Ser Val Ala
 485 490 495
 Thr Thr Tyr Ser Ser Val Pro Pro Ala Phe Pro Ala Gln Val Ser Ser
 500 505 510
 Phe Pro Ser Ser Ala Val Thr Asn Ser Phe Ser Ala Ser Thr Gly Leu
 515 520 525
 Ser Asp Met Thr Ala Thr Phe Ser Pro Arg Thr Ile Glu Ile Cys
 530 535 540

<210> 338

<211> 148

<212> PRT

<213> Homo sapiens

<400> 338

Pro Pro Ala Thr Ser Tyr Ala Pro Ser Asp Val Pro Ser Gly Val Ala
 5 10 15
 Leu Phe Leu Thr Ile Pro Phe Ala Phe Phe Leu Pro Glu Leu Ile Phe
 20 25 30
 Gly Phe Leu Val Trp Thr Met Val Ala Ala Thr His Ile Val Tyr Pro
 35 40 45

Leu Leu Gln Gly Trp Val Met Tyr Val Ser Leu Thr Ser Phe Leu Ile
50 55 60

Ser Leu Met Phe Leu Leu Ser Tyr Leu Phe Gly Phe Tyr Lys Arg Phe
65 70 75 80

Glu Ser Trp Arg Val Leu Asp Ser Leu Tyr His Gly Thr Thr Gly Ile
85 90 95

Leu Tyr Met Ser Ala Ala Val Leu Gln Val His Ala Thr Ile Val Ser
100 105 110

Glu Lys Leu Leu Asp Pro Arg Ile Tyr Tyr Ile Asn Ser Ala Ala Ser
115 120 125

Phe Phe Ala Phe Ile Ala Thr Leu Leu Tyr Ile Leu His Ala Phe Ser
130 135 140

Ile Tyr Tyr His
145

<210> 339

<211> 196

<212> PRT

<213> Homo sapiens

<400> 339

Met Pro Gly Met Phe Phe Ser Ala Asn Pro Lys Glu Leu Lys Gly Thr
5 10 15

Thr His Ser Leu Leu Asp Asp Lys Met Gln Lys Arg Arg Pro Lys Thr
20 25 30

Phe Gly Met Asp Met Lys Ala Tyr Leu Arg Ser Met Ile Pro His Leu
35 40 45

Glu Ser Gly Met Lys Ser Ser Lys Ser Lys Asp Val Leu Ser Ala Ala
50 55 60

Glu Val Met Gln Trp Ser Gln Ser Leu Glu Lys Leu Leu Ala Asn Gln
65 70 75 80

Thr Gly Gln Asn Val Phe Gly Ser Phe Leu Lys Ser Glu Phe Ser Glu
85 90 95

Glu Asn Ile Glu Phe Trp Leu Ala Cys Glu Asp Tyr Lys Lys Thr Glu
100 105 110

Ser Asp Leu Leu Pro Cys Lys Ala Glu Glu Ile Tyr Lys Ala Phe Val
115 120 125

His Ser Asp Ala Ala Lys Gln Ile Asn Ile Asp Phe Arg Thr Arg Glu
130 135 140

Ser Thr Ala Lys Lys Ile Lys Ala Pro Thr Pro Thr Cys Phe Asp Glu
 145 150 155 160

Ala Gln Lys Val Ile Tyr Thr Leu Met Glu Lys Asp Ser Tyr Pro Arg
 165 170 175

Phe Leu Lys Ser Asp Ile Tyr Leu Asn Leu Leu Asn Asp Leu Gln Ala
 180 185 190

Asn Ser Leu Lys
 195

<210> 340

<211> 316

<212> PRT

<213> Homo sapiens

<400> 340

Met Ala Thr Phe Val Glu Leu Ser Thr Lys Ala Lys Met Pro Ile Val
 5 10 15

Gly Leu Gly Thr Trp Lys Ser Pro Leu Gly Lys Val Lys Glu Ala Val
 20 25 30

Lys Val Ala Ile Asp Ala Gly Tyr Arg His Ile Asp Cys Ala Tyr Val
 35 40 45

Tyr Gln Asn Glu His Glu Val Gly Glu Ala Ile Gln Glu Lys Ile Gln
 50 55 60

Glu Lys Ala Val Lys Arg Glu Asp Leu Phe Ile Val Ser Lys Leu Trp
 65 70 75 80

Pro Thr Phe Phe Glu Arg Pro Leu Val Arg Lys Ala Phe Glu Lys Thr
 85 90 95

Leu Lys Asp Leu Lys Leu Ser Tyr Leu Asp Val Tyr Leu Ile His Trp
 100 105 110

Pro Gln Gly Phe Lys Ser Gly Asp Asp Leu Phe Pro Lys Asp Asp Lys
 115 120 125

Gly Asn Ala Ile Gly Gly Lys Ala Thr Phe Leu Asp Ala Trp Glu Ala
 130 135 140

Met Glu Glu Leu Val Asp Glu Gly Leu Val Lys Ala Leu Gly Val Ser
 145 150 155 160

Asn Phe Ser His Phe Gln Ile Glu Lys Leu Leu Asn Lys Pro Gly Leu
 165 170 175

Lys Tyr Lys Pro Val Thr Asn Gln Val Glu Cys His Pro Tyr Leu Thr
 180 185 190

Gln Glu Lys Leu Ile Gln Tyr Cys His Ser Lys Gly Ile Thr Val Thr
 195 200 205

Ala Tyr Ser Pro Leu Gly Ser Pro Asp Arg Pro Trp Ala Lys Pro Glu
 210 215 220

Asp Pro Ser Leu Leu Glu Asp Pro Lys Ile Lys Glu Ile Ala Ala Lys
 225 230 235 240

His Lys Lys Thr Ala Ala Gln Val Leu Ile Arg Phe His Ile Gln Arg
 245 250 255

Asn Val Ile Val Ile Pro Lys Ser Val Thr Pro Ala Arg Ile Val Glu
 260 265 270

Asn Ile Gln Val Phe Asp Phe Lys Leu Ser Asp Glu Glu Met Ala Thr
 275 280 285

Ile Leu Ser Phe Asn Arg Asn Trp Arg Ala Cys Asn Val Leu Gln Ser
 290 295 300

Ser His Leu Glu Asp Tyr Pro Phe Asn Ala Glu Tyr
 305 310 315

<210> 341

<211> 422

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(422)

<223> n = A,T,C or G

<400> 341

gatganattt	ttncnagaga	gaggaagang	ctattcagtt	ggatgggatt	aaatgcatca	60
caaataagag	aacttagaga	gaagtcggaa	aagtttgctt	tccaagcccg	aagttaacag	120
aatgatgaaa	cttatcatca	attcattgta	taaaaataaa	gagattttcc	tgagagaact	180
gatttcaa	atgcttctgatg	cttttagataa	gataaggcta	atatcactga	ctgatgaaaa	240
tgctctttct	ggaaatgagg	aactaacagt	caaaattaag	tgtgataagg	agaagacctg	300
ctgcatgtca	cagacaccgg	tgtaggaatg	accagagaag	agttgggtta	aaaccttggt	360
accatagcca	aatctgggac	aagcgagttt	ttaaacaaaa	tgactgaagc	acaggaagat	420
gg						422

<210> 342

<211> 472

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(472)

<223> n = A,T,C or G

<400> 342
 ctggagaagg tgtgcagggg aaaccctgct gatgtcaccg aggccaggtt gtctttctac 60
 tcgggacact cttcctttgg gatgtactgc atggtgttct tggcgctgna tgtgcaggca 120
 cgactctgtt ggaagtgggc acggctgctg cgaccacag tccagttctt cctggtggcc 180
 tttgccctct acgtgggcta caccgcgtg tctgattaca aacaccactg gagcgaatgc 240
 cttgttggcc tctgcaggg ggcactggtg gctgccctca ctgtctgcta catctcagac 300
 ttcctcaaag cccgaccccc acagcactgt ctgaaggagg aggagctgga acggaagccc 360
 agcctgtcac tgacgttgac cctgggcgag gctgaccaca accactatgg ataccgcac 420
 tcctcctcct gaggccggac cccgccagg caggagcta ctgtgagtcc ag 472

<210> 343
 <211> 139
 <212> DNA
 <213> Homo sapien

<400> 343
 gtccctgggc tcccccttcc ctcaagccag ggctcctcct cctgtcgtgg gctcattgtg 60
 accactggcc tctctacagc acggcctgtg gcctgttcaa ggcagaacca cgacccttga 120
 ctcccggttg gggaggtgg 139

<210> 344
 <211> 235
 <212> DNA
 <213> Homo sapien

<400> 344
 ctgcgggctc agcacagtag acatgactgg gatccccacc ttggacaacc tccagaaggg 60
 agtccaattt gctctcaagt accagtgcgt gggccagtgt gtttacgtgc attgtaaggc 120
 tgggcgctcc aggagtcca ctatggtggc agcatacctg attcaggtgc acaaattggag 180
 tccagaggag gctgtaagag ccacgcca gatccggtca tacatccaca tcagg 235

<210> 345
 <211> 458
 <212> DNA
 <213> Homo sapien

<400> 345
 ctgtaagggt ctattcagtc ctgtgacct tattttggaa tgctcttcat tactgttgct 60
 ctgttttgtg acttctggg aaaccgccta ctttgggtgt gtgtcacctt gagctgtgca 120
 cataggacac cagttttgac ttaacctaac aggcagtttt tatctctagc tttttcaagc 180
 caggtattga gcagtttctt ggccaatggc ctgagaaacc acctgtccct gtcaaggggt 240
 gattttattg gttttaagtg gggaagtaat cccatgtact tatttcttaa atacctagga 300
 agttcttctt ggtggctcct cttggccctc ccctctttct cccccaacct accatcctgc 360
 aaggcaagga atggcctct cctccacaga ggcaacggct gcagagggag cactgtggct 420
 gccatcccag ttcctcttca aagccaaaca gacacgag 458

<210> 346
 <211> 525
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(525)
 <223> n = A,T,C or G

<400> 346
 ccagagcaca acgcctcacc atggactgga cctggaggat nntcttnnng gtggcagcag 60
 ccacaggtgt ccactcccaa gcccaacttg tgcagtctgg ggctgaggag aagaagcctg 120
 gggcctcagt gactatttct tgtaaggctt ctggatata ncttactaaa tatactttac 180
 attgggtgcg ccaggccccc cccggacaaa gacctgaatg ggtgggatgg atcaacactg 240
 gcattgatac cgtaaataat tcacagaagt ttcaggacag agtctccatt acctgggact 300
 catccgcgac cacagnctac ctgnanntga gtacgctgga atccgaagac acggctgtgt 360
 attactgtgc gagacttang gcccgcttcgc tgtgggtggga cttaatgacg cttttgacat 420
 ctggggccaa gggacagtgg tcaccgtctc ttcanggagt gcattcgccc caaccctttt 480
 cccctctct cctgtgaaga attccccgnc ggatacgagc agcgt 525

<210> 347
 <211> 423
 <212> DNA
 <213> Homo sapien

<400> 347
 ccagacgctg acttgtttct gaggccttaa gcaggaagga tttgaaatcc tggagcttgg 60
 cagtcttgct ctccacctct aagccaatgt tgaccccttc atctataaag tccacaactc 120
 tccggaagtc atcctcacgg aactgtcgag aagttaaggc tggggcccca agccgcaggc 180
 cgcccggtgt gatggcactt cgggtctccag gacaggtgtt cttgttggca gtgatggata 240
 caagctctag caccgcgtca gcccgagctc catccaggcc cttgggcccgc aggtccacca 300
 gcaccagggtg gttgtcagta ccacctgata ccagtgaagta gcctcgctct agcagggcat 360
 ctgccatggc ccgagcattc ttcagaacct gcagggagta ctcccggaac atgggggtgc 420
 agg 423

<210> 348
 <211> 513
 <212> DNA
 <213> Homo sapien

<400> 348
 cctctaggcc tgatgctctc agaggcaata gaagaaaagt aaaaggaagg tctcacttca 60
 cagacaatga aaccctccta accctcttcc ccactaccca caactcccta cactgccaat 120
 ctaaataaaa agaggacaat gcatgagtgt gagatacaca tacacacaca cacatacaca 180
 cacacacacg cacagcttcc tttcagccaa agaactgcaa aatccttccc cggaaggagg 240
 acaactggca acaccaatca aggcttgggt gtctaagggt atggctggaa tcatgtgaga 300
 ctggtaaaaa tccagggaga aaatgtttca ccttcagctc attcccaagt ctctatgaag 360
 cccgccccac ttccacatag gggaactgtg gctctggggg cagcctctgc agctactcag 420
 aataggtggg aggaggggct ggctttgagg ctgccttagc catgaggctc tttgcctagg 480
 aatagctgga gatgggagct gcagggggct cag 513

<210> 349
 <211> 231
 <212> DNA
 <213> Homo sapien

<400> 349
 ccttatttct cttgtccttt cgtacaggga ggaatttgaa gtagatagaa accgacctgg 60
 attactccgg tctgaactca gatcacgtag gactttaatc gttgaacaaa cgaaccttta 120
 atagcggctg caccatcggg atgtcctgat ccaacatcga ggtcgtaaac cctattgttg 180
 atatggactc tagagtagga ttgcgtgtt atccctaggg taacttgttc c 231

<210> 350

<211> 341
 <212> DNA
 <213> Homo sapien

<400> 350
 ctgccccagg gcgttcgtaa cgggaatgcc gaagcgtggg aaaaagggag cgggtggcggg 60
 agacgggggat gagctcagga cagagccaga ggccaagaag agtaagacgg ccgcaaagaa 120
 aaatgacaaa gaggcagcag gagagggccc agccctgtat gaggaccccc cagatcagaa 180
 aacctcaccc agtggcaaac ctgccacacc caagatctgc tcttggaatg tggatgggct 240
 tcgagcctgg attaagaaga aaggattaga ttgggtaaag gaagaagccc cagatatact 300
 gtgccttcaa gagaccaaatt gttcagagaa caaactacca g 341

<210> 351
 <211> 256
 <212> DNA
 <213> Homo sapien

<400> 351
 ggcgttgggg acggttgtag gacgtggctc tttattcgtg agttttccat ttacctccgc 60
 tgaacctaga gcttcagacg ccctatggcg tccgcctcga cccaaccggc ggcccttgagc 120
 gctgagcaag caaagggtgg cctcgcggag gtgatccagg cgttctccgc cccggagaat 180
 gcagtgcgca tggacgaggc tcgggataac gcctgcaacg acatgggtaa gatgctgcaa 240
 ttcgtgctgc ccgtgg 256

<210> 352
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 352
 cctttcttgt aagtgaagaa naaggaatgc agcaaagaag agttcgacat tggagtcctt 60
 agttccatca ggatccatt cgcagccttt agcatcatgt agaagcaaac tgcacctatg 120
 gctgagatag gtgcaatgac ctacaagatt ttgtgttttc tagctgtcca ggaaaagcca 180
 tcttcagtct tgctgacagt caaagagcaa gtgaaaccat ttccagccta aactacataa 240
 aagcagccga accaatgatt aaagacctct aaggctccat aatcatcatt aaatatgccc 300
 aaactcattg tgacttttta ttttatatac aggattaaaa tcaacattaa atcatcttat 360
 ttacatgg 368

<210> 353
 <211> 368
 <212> DNA
 <213> Homo sapien

<400> 353
 ctgaggggtg gcagtaagca atgaggatgg gctataaagc tgtaactgg ctaagggcca 60
 tccttgggca ggcatttcag acacatctgt agagagggca gtagcatctc cgataggcca 120
 gctctgaagg aagcttaatg cttaatacag tcacactgca taaattagct tagaatgctc 180
 tcttgggtaa aaaatattaa tagtgtatat gcacttgaag agcaaaattc ctcaagaaaa 240
 aaagtttaat agcaaggagt ttccatcagt cccggtcttt gtgaggatta ccacaacaaa 300
 cacttaaaag gatacaacag gtacttatta aatgctgcct tgccttttac ctcttccttt 360

ttttttttt

368

<210> 354
 <211> 380
 <212> DNA
 <213> Homo sapien

<400> 354
 ccatggcttc tcacccagac agtctttctg ggcaacttgg ggaagcccct gttctgctca 60
 agtctcaccc catggaagag gtgggggaag ggggccttgg tttttcagga agacaggttg 120
 gagagcacga gtcactacaa agcagtaaaa gtgaatggtg tctccagggg ctgggtccag 180
 aacaccacgg agagccccag ccataaagggt gtgttccgcc tctggcctgc aggaatctct 240
 ttgaatctct ttgattggtg gtcceaagag caatgggaag tcaacagcca ggaggctgga 300
 ctgggttccc tgggacccc aggtcccaga gctgctgggc agtggttgtc ggcaagaag 360
 aaaggtccaa gaggtcagg 380

<210> 355
 <211> 347
 <212> DNA
 <213> Homo sapien

<400> 355
 ccagtggagg ggtgggggta tcgatcccg cgggggctgg cttggttgct ggtgccctga 60
 gcccttctct gccgcctgg gtgttgctt cactgatgga ggtaggcgtc cagccagatg 120
 tcaccagact tcttcgggga cctgacgatg tccaccagcg cggtaggaa gggcttctact 180
 tcgtagctga ggccgtgctt ggcacacagc gacttgacca gcggggccac ccggctgtag 240
 ttgtgtctcg gcctcctggg gaagaggtgg tgctcgatct ggaagttgag gtgcccgctg 300
 aaccagttgg tgaaaagtga gggctccacg ttgcaggtgg ctgccag 347

<210> 356
 <211> 157
 <212> DNA
 <213> Homo sapien

<400> 356
 cctggagctg ctgaagactg ctattgggaa agctggctac actgataagg tggatcatcg 60
 catggacgta gcggcctccg agttcttcag gtctgggaag tatgacctgg acttcaagtc 120
 tcccgatgac cccagcaggt acatctcgcc tgaccag 157

<210> 357
 <211> 323
 <212> DNA
 <213> Homo sapien

<400> 357
 ccatacaggg ctgttgccca ggccctagag gtcactcctc gtaccctgat ccagaactgt 60
 ggggccagca ccatccgtct acttacctcc cttcgggcca agcacacca ggagaactgt 120
 gagacctggg gtgtaaagtg tgagacgggt actttggtgg acatgaagga actgggcata 180
 tgggagccat tggctgtgaa gctgcagact tataagacag cagtggagac ggcagttctg 240
 ctactgcgaa ttgatgacat cgtttcaggc cacaaaaaga aaggcgatga ccagagccgg 300
 caaggcgggg ctctgatgc tgg 323

<210> 358
 <211> 555
 <212> DNA

<213> Homo sapien

<400> 358

aaaagggtttc	taaaacatga	cggagggttga	gatgaagctt	cttcatggag	taaaaaatgt	60
attttaaaga	aaattgagag	aaaggactac	agagccccga	gttaatacca	atagaagggc	120
aatgctttta	gattaaaatg	aaggtgactt	aaacagctta	aagtttagtt	taaaagttgt	180
aggtgattaa	aataatttga	aggcgatctt	ttaaaaagag	attaaaccga	aggtgattaa	240
aagaccttga	aatccatgac	gcagggagaa	ttgcgtcatt	taaagcctag	ttaacgcatt	300
tactaaacgc	agacgaaaat	ggaaagatta	attgggagtg	gtaggatgaa	acaatttgga	360
gaagatagaa	gtttgaagtg	gaaaactgga	agacagaagt	acgggaaggc	gaagaaaaga	420
atagagaaga	tagggaaatt	agaagataaa	aacatacttt	tagaagaaaa	aagataaatt	480
taaacctgaa	aagtaggaag	cagaagaaaa	aagacaagct	aggaaacaaa	aagctaaggg	540
caaaatgtac	accac					555

<210> 359

<211> 549

<212> DNA

<213> Homo sapien

<400> 359

ctgccaggct	gaaaagaagc	ctcagctccc	acaccgccct	cctcaccgcc	cttcctcggc	60
agtcacttcc	actggtggac	cacgggcccc	cagccctgtg	tcggccttgt	ctgtctcagc	120
tcaaccacag	tctgacacca	gagcccactt	ccatcctctc	tgggtgtgagg	cacagcgagg	180
gcagcatctg	gaggagctct	gcagcctcca	cacctaccac	gacctcccag	ggctgggctc	240
aggaaaaacc	agccactgct	ttacaggaca	gggggttgaa	gctgagcccc	gcctcacacc	300
cacccccatg	cactcaaaga	ttggatttta	cagctacttg	caattcaaaa	ttcagaagaa	360
taaaaaatgg	gaacatacag	aactctaaaa	gatagacatc	agaaattggt	aagttaagct	420
ttttcaaaaa	atcagcaatt	cccagcgta	gtcaagggtg	gacactgcac	gctctggcat	480
gatgggatgg	cgaccgggca	agctttcttc	ctcgagatgc	tcttgctgct	tgagagctat	540
tgcttttggt						549

<210> 360

<211> 289

<212> DNA

<213> Homo sapien

<400> 360

tttaaatttt	actagtgtta	cttaatgtat	attctaaaaa	gagaatgcag	taactaatgc	60
cctaaatggt	tgatctctgt	ttgtcattac	tttttcaaaa	ttattttttt	ctgtaaagta	120
taatataata	aacttcttgc	ttaaattgaa	tttctatatt	agtggttaat	tgcagtttat	180
taaagggatc	attatcagta	atttcatagc	aactgttcta	gtgtttttgt	ttttttaaac	240
agaattagga	atttgagata	tctgattata	tttttcatat	gaatcacag		289

<210> 361

<211> 311

<212> DNA

<213> Homo sapien

<400> 361

ctgttcagta	tggcaaaggg	cagacttact	ccttcatcca	ctctgctgcc	ttgatgaggt	60
gaacacactg	gaataagatg	gagggcagga	tacctgccaa	agcctgagga	atgagatgat	120
ctgaaacaat	tgggcaaagg	ctggacattt	caaaaagctg	acttccaact	gcagtttatg	180
ggtatagaat	ttgatgcttc	cctcaagtcc	tgactgctct	ttctgaggca	gccaggctag	240
gccaagaaat	gagctgctcc	agcttctcca	gagcacagca	gcctcccagg	gcctgtcagc	300
atctgcagca	g					311

<210> 362
 <211> 496
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(496)
 <223> n = A,T,C or G

<400> 362
 ccagtttcta aaanaatgca catttaaaga gaagcatcta ccacggcttt aaaacaaaac 60
 aactctgaga tgaacaatat gtgttatact cagagattaa caatctcaat catacatact 120
 gattctttca gacatttaat aaccactaca tttttttgca ttaatgaagt ttgactatat 180
 gtgtaaaggg actaaatatt tttgcaacag cctgttcttt gttcattctt ttctggatag 240
 cgtgtcctct gtattgcggt agatttatac attctgttgc ctaaatatgt gtgtaaaatg 300
 agctgataaa ctggagtact acttaaaaaa aagtctgtga tttataagat gcatatgctt 360
 tctatgtgaa tataagcttg tgcacaatgt ttaaaagaaa aacaatgaat tagaagagat 420
 ccccggtccc ccagtctgac atatttcata cagaatgttt aaaagaaaaa ctctgctagt 480
 cttggcaaac atttgg 496

<210> 363
 <211> 673
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(673)
 <223> n = A,T,C or G

<400> 363
 ccaagagggga gataanacaa acttctcaaa caaaaagaaa agaaaaacga atgattcatc 60
 tgctttaatc agtgtgatta atgcagcacc cattgccccg ggaaccgttt ctgctgtact 120
 atctggatac taaaatgtta cggaagtagc tctttgttct ccctcactct gcccttagtt 180
 aatagaaatt cagactcgcc aagtaaggct ttgtgcatag tgtcttcatg tcgcgtatag 240
 ttgagcgcgt tcttagcagt tggcttcatg gacagctcat tagtgttttg acttttctta 300
 cccagcgtta attgaattct tgctttttag caacttcctt tttgtagtgg tgaaccttgc 360
 ccttttagtac agttcaagtg aatctggata attgttcac cttgcttttag cttagatacc 420
 atgtagtggt ctgtggctac aggaagctgg ttctgtctgc ttccacagtc tgcttaaaaa 480
 actgtctgac ttcgtgaata tagagaccaa gttaccact tctgatgaag agaccaatta 540
 agattcattc ctcatctctg ttctttccag tgggagaaga gtcccatga aataagatga 600
 aactgattcc atgcactagt acatgtaggc ttctcccttg cgcaaagctt aacaatttgt 660
 aggaaacttt ggg 673

<210> 364
 <211> 495
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(495)
 <223> n = A,T,C or G

<400> 364

ccaaatgttt	gcncaagact	agcagagttt	ttctttttaa	cattctgtat	gaaatatgtc	60
agactggggg	acgggggatc	tcttctaatt	cattgttttt	cttttaaaca	ttgtgcacaa	120
gcttatattc	acatagaaa	catatacatc	ttataaatca	cagacttttt	tttaagtagt	180
actccagttt	atcagctcat	tttacacaca	tatttaggca	acagaatgta	taaatctacc	240
gcaatacaga	ggacacacta	tccagaaaag	aatgaacaaa	gaacaggctg	ttgcaaaaat	300
athtagtccc	tttacacata	tagtcaaact	tcattaatgc	aaaaaatgta	gtggttatta	360
aatgtctgaa	agaatcagta	tgtatgattg	agattgttaa	tctctgagta	taacacatat	420
tgttcacctc	agagttgttt	tgttttaaag	ccgtggtaga	tgcttctctt	taaatgtgca	480
tttttttagaa	actgg					495

<210> 365

<211> 291

<212> DNA

<213> Homo sapien

<400> 365

aactgacaag	cccttgcgcc	tgcctctcca	ggatgtctac	aaaattgggtg	gtattgggtac	60
tgttcctgtt	ggcccgagt	gagactgggt	ttctcaaacc	cggtatgggtg	gtcacctttg	120
ctccagtcaa	cgttacaacg	gaagtaaaat	ctgtcgaaat	gcaccatgaa	gctttgagtg	180
aagctcttcc	tggggacaat	gtgggcttca	atgtcaagaa	tgtgtctgtc	aaggatgttc	240
gtcgtggcaa	cgttgctgg	gacagcaaaa	atgaccacc	aatggaagca	g	291

<210> 366

<211> 277

<212> DNA

<213> Homo sapien

<400> 366

ctggatgggtg	cctcagaagg	tgcattctgc	ttctgcaggg	gcttgaaaca	ccaaggcact	60
ccagggatcc	tggagtcaaa	gcagcagccc	cggttggtgc	actccttggg	ggtgacatgg	120
gggtagcccc	cagtccaccc	tgtccttggc	tggcacggca	cactggtttg	cagacaggcc	180
cacgtactcc	tcagcagagc	tggaggacaa	gcaaggccag	gaccagcccc	agcatgcaga	240
gcgctctggc	agccatgacc	accgtgggct	ccgggac			277

<210> 367

<211> 311

<212> DNA

<213> Homo sapien

<400> 367

ccagagctgc	ggggcctcag	tacacggagc	tgttcgggat	gccacagcac	agcaccatgc	60
tcaggatcat	ctcgaagatc	atgatcacag	cgaccacgat	ggcagcaatg	ccgatgaggt	120
acagcttccc	ggagaagagg	tcatcgatct	tctgggtggca	gtcctccttg	aagaggttgc	180
tgatgatgtt	gctgccccag	ggacacaaat	tgttcttgag	cactgaggtg	gtcaaagcag	240
tcagtgtgct	ggagccacag	cagtcaagcg	tctcgtggaa	ggtcttcacc	acagccttgg	300
cgttgttggc	g					311

<210> 368

<211> 384

<212> DNA

<213> Homo sapien

<400> 368

ccaaaggggt	ctctagctgc	tgctctgctg	ctcctgctca	tggatgagtt	tggcgatggg	60
gccgggtgatg	ccgcctatca	aggtccagta	ctcatcgaag	ctgatgcgcc	catcaggatt	120
ggcatccagg	ttctggatga	gcttatccgc	agccttccgg	ttccctgtgt	ccgacagcat	180
gtgggttcagc	tctttctgga	gcatctcgcg	gaagctgctc	ttgctgatct	tgttcttgac	240
caggctgtac	ctagacacat	atgtgtagaa	gttttccacc	aggacaatga	ctgccttctc	300
cagctccgtg	tagcaagtct	gacatctccc	tgcttcgcct	gctggcgggg	cctaaggcgg	360
gggccaagcc	cagttacagc	ccag				384

<210> 369

<211> 216

<212> DNA

<213> Homo sapien

<400> 369

ccaagtgcc	ggtggctttc	agcagcttcc	tacgatcagc	cgaagaaagc	agaagctctg	60
gaggctgcc	tcgagaacct	caatgaagcc	aagaactatt	ttgcaaaggt	tgactgcaaa	120
gagcgcac	gggacgtcgt	ttacttccag	gccagactct	accataccct	ggggaagacc	180
caggagagga	accggtgtgc	gatgctcttc	cggcag			216

<210> 370

<211> 561

<212> DNA

<213> Homo sapien

<400> 370

ctggctcctt	cttttgtggt	cgtttggggg	atgggctggt	ttgggggtta	ggtgcagaga	60
atggtttggg	gccactgcgt	actggaccac	tctgagcctt	cagggcaggg	ttcttgtgag	120
tcttcatgtc	atcagataca	tgtttcaggg	catgtgtaat	gctctcccc	tgattaatct	180
gcgcgaacag	tgctgagcgg	gaagcagact	catctgagcc	tgaactggta	gagactgggg	240
gaggaggggg	gcctgggtgga	gggggaggag	gacctgatcc	ggcagagggg	ccagatggca	300
gtccgctcag	ttcttttggc	acaggccccg	ttttgctcca	ggccagtcgg	gtggtatgga	360
actccttaat	gtaagcctgc	agctctgtcc	atatacttaa	ataagctttg	accagctcta	420
catgcttctt	atccacatct	ttgtactctt	tgaggactcg	gtttgtataa	aacatggcgg	480
catcattcat	ttcttttcga	taagggccag	gcttggggagc	catagccacc	cagcccaggg	540
cctggatact	ttcgttgaca	g				561

<210> 371

<211> 518

<212> DNA

<213> Homo sapien

<400> 371

cccacttcca	tcgctctctg	gtgtgaggca	cagcgagggc	agcatctgga	ggagctctgc	60
agcctccaca	cctaccacga	cctcccaggg	ctgggctcag	gaaaaaccag	ccactgcttt	120
acaggacagg	gggttgaagc	tgagccccgc	ctcacacca	cccccatgca	ctcaaagatt	180
ggattttaca	gctacttgca	attcaaaatt	cagaagaata	aaaaatggga	acatacagaa	240
ctctaaaaga	tagacatcag	aaattgttaa	gttaagcttt	ttcaaaaaat	cagcaattcc	300
ccagcgtagt	caagggtgga	cactgcacgc	tctggcatga	tgggatggcg	accgggcaag	360
ctttcttctt	cgagatgctc	tgctgcttga	gagctattgc	tttggttaaga	tataaaaagg	420
ggtttctttt	tgtctttctg	taagggtggac	ttccagcttt	tgattgaaag	tcctaggggtg	480
attctatttc	tgctgtgatt	tatctgctga	aagctcag			518

<210> 372

<211> 335

<212> DNA

<213> Homo sapien

<400> 372

ctggaggctg	ggtgcaccct	gccagatcc	acacctgtac	cccggcggaa	aggctcatgg	60
gcattgaaga	cggtggtgaa	aaagccaaag	ggaaaagcac	caacacccaaa	tgagaagtgg	120
aagcccccg	tatcaccaaa	tggctggaat	ccccctctgc	tctccggagc	tggctctctgg	180
ccctgggggc	ggggtggagt	ttttaatctg	ggatcctggg	gcttctggct	ccctcgccca	240
taaagcggga	caaccttctc	tctgctgac	ccagctttac	atactggaca	ctcttgccgt	300
tctggccgtg	tctccagcca	ctgatgaaga	catgg			335

<210> 373

<211> 467

<212> DNA

<213> Homo sapien

<400> 373

ccactagctg	aatcttgaca	tggaagggtt	tagctaattgc	caagtggaga	tgcagaaaat	60
gctaagttga	cttaggggct	gtgcacagga	actaaaaggc	aggaaagtac	taaatattgc	120
tgagagcatc	caccccagga	aggactttac	cttccaggag	ctccaaactg	gcaccacccc	180
cagtgtcac	atggctgact	ttatcctccg	tgttccattt	ggcacagcaa	gtggcagtgt	240
ctccaccacc	tatgatggtg	atgcagcccc	tagaagtggc	tttcaccacc	tcatccatga	300
gagctttggt	tccccgggca	aaagcttccc	attcaaatac	ccccacagga	ccattccaca	360
caatctgctt	agcccagtg	acagcctcag	catacttctt	gctgctttca	ggaccacagt	420
ccaagcccat	ccagccagca	ggtacgccag	aagccacagt	ggcttgg		467

<210> 374

<211> 284

<212> DNA

<213> Homo sapien

<400> 374

tttccgtaaa	agcgtgtaac	aagggtgtaa	atattttataa	ttttttatac	ctgttgtag	60
acccgagggg	cggcggcgcg	gttttttatg	gtgacacaaa	tgtatatattt	gctaacagca	120
attccaggct	cagtattgtg	accgcggagc	cacaggggac	cccacgcaca	ttccgttgcc	180
ttacccgatg	gcttgtagcg	cggagagaac	cgattaaaac	cgtttgagaa	actcctccct	240
tgtctagccc	tgtgttcgct	gtggacgctg	tagaggcagg	ttgg		284

<210> 375

<211> 307

<212> DNA

<213> Homo sapien

<400> 375

cctactcttc	tccgtccatt	gtactatctg	cccgtgggtg	ggatggcagt	aggatcatat	60
ttgatgactt	ccgagaagca	tattattggc	tccgtcataa	tactccagag	gatgcgaagg	120
tcatgtcctg	gtgggattat	ggctatcaga	ttacagctat	ggcaaaccga	acaattttag	180
tggacaataa	cacatggaat	aatacccata	tttctcgagt	agggcaggca	atggcgcca	240
cagaggaaaa	agcctatgag	atcatgaggg	agctcgatgt	cagctatgtg	ctggctattt	300
ttggagg						307

<210> 376

<211> 650

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(650)

<223> n = A,T,C or G

<400> 376

ccattgnctn ctnacgtgat gtcacatcatc gccagggtcat cttggcaaaa gtcggagcat	60
ttctcagtca ctgcaaagta gcccttctcg ttggagcacc ggaagagacg tgtgtgtttc	120
atgtactcgg catcgtcatc atagggttc tgtgccccaa tgcccaccca gaagaagttc	180
tcaggctcct caccttcgtt gataacctgc ttgctgtagg aggtgtcaaa catggtgttc	240
aggatgtctt ctgccaactt ggcttcgtca gggctctgatg cccggcccac ccaggcatac	300
acgatgccct ggttgtcctc actctcaaag ggaaccttga ggatgaagca gaactcggag	360
ttgaggaggc tggagtcggt gttgatctgg atgcaccggg tgcagagggc gctgccgttg	420
gtgcggatct ggtagaggct gggctgttg gcgccttcca ccgccttctt cttgccccgg	480
tggatgatga acttctctt gaaatgggac aggaacttgg ggttctctg ctgctgcgtc	540
atgcgtacca cctccagctt cccagggaag aggtctctga acttcttttg caggctgaag	600
gtgaagggtga cccacccata ttgggaggct ttcacggccc tgccagaagt	650

<210> 377

<211> 306

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(306)

<223> n = A,T,C or G

<400> 377

tctagatgca tgctcgagcg gccgccagtg tgatgganat ctgcagaatt cgcccttcga	60
gcggccgccc gggcagggttc ggggtctgcc ttcacctgcc aggcccttcc ccgctagctt	120
ggggcgagca gagctgcgtc cagtggaaact aaagccgttc caggattatc aaaaactgag	180
cagcaacctt gggggacctg gatcatcacg gactccccca actggaaggc ctttctctgg	240
cctcaattcc cgtctcaagg ccacgccttc cacctacagt ggagtcttcc gcacccagcg	300
cgtcga	306

<210> 378

<211> 199

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(199)

<223> n = A,T,C or G

<400> 378

ccacangtgg cacttgggtg tggctcctct gttatttgtc ctcatgtgag aaagcagatc	60
atctccaaat cttgccattt gtatactttt ggtggagact tggatgtcat atcttctttg	120
ttttgggttt tcttccctag cttattttgt ggcttttaaa gaagtggatt gtattgtgag	180
atcctgtgat tcctggtgg	199

<210> 379

<211> 216

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(216)

<223> n = A,T,C or G

<400> 379

ccagggcang	tcatcaagag	gggcattgtc	ttgcatgcgg	cctgccgtgt	ccaccagcac	60
cacgtcaaag	ccttggttac	gtgcaaaagc	aatggcttcc	atggcaatgc	cagcagcatc	120
cttgccatag	cccttttcaa	acaactgcac	catgggtgcg	ccaccatgct	tctctggagg	180
gtgtagggca	ctcaaacgcc	gggtgtgtgt	acgcag			216

<210> 380

<211> 555

<212> DNA

<213> Homo sapien

<400> 380

ccatgggcct	tcctttccac	taaaaggaat	tccgaacagc	aaaaagaagg	tcttgagata	60
gtgaaaatgg	tgatgatatc	tttagaaggt	gaagatgggt	tggatgaaat	ttattcattc	120
agtgagagtc	tgagaaaact	gtgcgtcttc	aagaaaattg	agaggcattc	cattcactgg	180
ccctgccgac	tgaccattgg	ctccaatttg	tctataagga	ttgcagccta	taaatcgatt	240
ctacaggaga	gagttaaaaa	gacttggaca	gttgtggatg	caaaaaccct	aaaaaaagaa	300
gatatacaaa	aagaaacagt	ttattgctta	aatgatgatg	atgaaactga	agttttaaaa	360
gaggatatta	ttcaaggggt	ccgctatgga	agtgatatag	ttcctttctc	taaagtggat	420
gaggaacaaa	tgaaatataa	atcggagggg	aagtgtctct	ctgttttggg	attttgtaaa	480
tcttctcagg	gtcagagaag	attcttcattg	ggaaatcaag	ttctaaaggc	tttgccccaa	540
gagatgatga	ggcag					555

<210> 381

<211> 406

<212> DNA

<213> Homo sapien

<400> 381

ctgcaccagg	tgggcctcta	ggteccatta	agccatttgg	tccagggcca	agtccaactc	60
cttttccatc	atactgagca	gcaaagttcc	caccgagacc	agggggggcca	ggaggaccag	120
gtggaccagg	agggcctgtg	ggaccatctt	caccatctct	gcctgggggg	cctgggtggac	180
cccttttctc	acgtggtcct	ctatctccgg	ctggggccctt	tcttacagtt	tcctcttgta	240
aagattggca	tgttgctagg	cataagggtta	ctgcaagcag	caacaaagtc	cgcgtatcca	300
caaagctgag	catgtctagc	acttagacat	gcagactcct	tgtgtcgcag	agccctctggg	360
tcaccggcgg	aggtatcacc	tggcgggcgc	gggcatgcag	tcgtgg		406

<210> 382

<211> 528

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(528)

<223> n = A,T,C or G

<400> 382


```

ctgagcagtt tgtgggtntn tcttcccga agtttcagga agtattcaca aaagaaaaat      60
acattttttt cccaggggt ggggcaagga cagtggagag agtgctagga aatgagtcct      120
ctgggaaagg ggaccgggcc gtgatgttaa atatctccgg ctccaagtg actggatttg      180
cctaggacct tcagaccaac agacttcaga cctcagacc tgccccgggg ccaggtggag      240
aaagtgaggg ccgtacaagg aagtgaatt ctgagttgtt ggggctaagc ctgacccct      300
ctccatgctc cccgccccaa cccactctgg cctcagtaga tttttttt agttgtggtt      360
gttgcccagg ctggagtga gtagcgccat cttggctcac tgcacctcca ccttcgggc      420
tcaagcgatt ctccagctc agcctcctga gtagctagga ctgcaggtgc tccaccacgc      480
ccggctaatt tttgtatttt tagtagagat ggggtttccc catgttgg      528

```

<210> 383

<211> 335

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(335)

<223> n = A,T,C or G

<400> 383

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ccatnttgag tctactcctg cgtcttgtgc cctagcacc cgagaaccgt cagtttgagc      60
cagatggaag ctgagctgaa cacattacga tggatgatgg aaacataaga ctatcaagaa      120
atccaagtgg taatgggcga agtttattca gcatccggca atggacttat cgtagttggg      180
gaaacgggtg ttccgaataa tatcctggaa gttatcagga cacctatttt aaatataggc      240
ctgaattttg taaagtaata tttaagggtg tccgtgataa ttaaataaaa tgcttaattc      300
atgtggcgaa aaaaaaaaaa naaaaaaaaa aaaaa      335

```

<210> 384

<211> 333

<212> DNA

<213> Homo sapien

<400> 384

```

agtccaatac ggctattggg gttgtagcag ctttcagagg aaattagtgg tctgggcttg      60
cctccagctc cccaggggca gcccagtag ctacactgtc cagacagcac aagaccaggc      120
tggtgtcacg tccatccgag cgtgcctca gggatcgata aagtttact gcagaaagtc      180
tccactgcgg tatgtgaca tctgcctga accttcacc tacagcatta caggctttaa      240
tcagattctg ctggaaagac acaggctgat ccacgtgacc tcttctgcct tctactgggt      300
ggggtgatcc ttggtgcctt tgtttccaca agg      333

```

<210> 385

<211> 343

<212> DNA

<213> Homo sapien

<400> 385

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ctgtgacacc tcaggttgaa agggctcttc tccttgaaca cccaccgagg ggcctggagc      60
aacagccagc cgatatggac ttctagctgc accgggtcac tgagggtgga gaggtttgtc      120
tggcacctgt actctccact gtcgtcgact gtggcagcgt caatgaagta gtcgaggcc      180
tggcttgaga tgaggctctc attgtgaaac cactgtgtgg aattgtctc aggggahtag      240
gtccctggc acttcagagt cacactgtcc ttctcgagca cctgtacca ttgaggctcc      300
aggaacacca cagcctttgg gagatcttca gtccgcatgc caa      343

```

<210> 386

<211> 244
 <212> DNA
 <213> Homo sapien

<400> 386
 tattcttttga ttcttggtgcaa ataggtgaga gaactaatag caaccaggca actgaggacg 60
 aagtcaaaaaa gtcggttaaca gaagaatgga atcagccaac ccacttgata agaaattgct 120
 ccataaacca gcattgaact gattataaac ataagaacag agacggcaaa aagaacacag 180
 gcattatcag ccattctctc agacgaatag taattaccga tgacttcata ctgaatgttg 240
 acag 244

<210> 387
 <211> 504
 <212> DNA
 <213> Homo sapien

<400> 387
 atctggagtc cagcctcagg gatgcgctac tttccattct ctgcattgaa cattcgttct 60
 gtcagcatcc gctccagctt cactgcatca gcggcaaac tgcggatccc gtcagagagc 120
 ttctccacag ccatctggtc ctcggtgtgc aaccaacgga aagacttctc atccaggtgg 180
 attttttcca ggtcactggc ttgggccgcc ttggctgaga gcacaggcac cagcttggcg 240
 ttgtcctgca gcagctctcc caggagcttg ggtgggatgg tgaggaagtc acagccggcc 300
 agtgctttga tctcgcccggt gttgcggaag gaggcgcccc tgacaatggt tttgtagcta 360
 aacttcttgt agtagttgta gatttttagtg acactcttta cccaggggtc ttrcaggggc 420
 tcataggatt tcttgtcggt gtttgccaca tgccaatcaa ggatgcgccc aacaaatggg 480
 gagatgaggg tcacaccgc ctcg 504

<210> 388
 <211> 450
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(450)
 <223> n = A,T,C or G

<400> 388
 gccaaagtgc tgcntgaatt ccactccctt ggttttcgcc tgcccagcgt tgctgtttgc 60
 gtggaggggtg gggggagctc agtggcaggg aatcagcggc ccgtgggggtc gtgggggacgg 120
 gaacatgtgc ccgaccgctc catccctcc tcctccttag gatgcataac ctaccttgtc 180
 tttttttttt taaattttnt ttccaggtan agtagctntt tgtacataaa naataacttga 240
 aaaattaatt gtatgatgta tgaaaanaca nagtctccta gttttgtatn ttgttgtatg 300
 actgccatga gttccaccaa aaagccactn tattttggtc tntgtgacat tttaaatgcg 360
 tgacaaaagt gagcaataa agngaggaan aaatntatnt atganataat atanattgta 420
 ttgaaatcta aaaaaaaaaa aaaaaaaaaa 450

<210> 389
 <211> 297
 <212> DNA
 <213> Homo sapien

<400> 389
 cctgcacttg aacatggctt tggttttaag caacttctct accctgacct tcctcctggg 60
 acagcgtttc gggaggtttc ttggcctcac tgagagggat gtggagctgc tgtaccccg 120

caaggagaag	gtattctaca	gcctgatgag	ggagagcggc	tacatgcaca	tccagtgcac	180
caagcctgac	accgtaggct	ctgctctgaa	tgactctcct	gtgggtctgg	ctgcctatat	240
tctagagaag	ttttccacct	ggaccaatac	ggaattccga	tacctggagg	atggagg	297

<210> 390
 <211> 223
 <212> DNA
 <213> Homo sapien

<400> 390						
ctgggctgga	gagttggtgc	tggcaaaaaca	gtccttcccc	tggggccggg	tcttaccag	60
gtccagagaa	accaacgcgg	gatgtcagac	ttcaccaaaa	ggactttctg	gttgcccctg	120
gctggcttcc	tggaggcgtt	cgcctctagt	ttctcagggg	tggagcgaga	gcccagccag	180
agaacagtaa	gaggagctgc	tctcctatct	gcactcaccc	agg		223

<210> 391
 <211> 365
 <212> DNA
 <213> Homo sapien

<400> 391						
ctgaggaaga	aatgaaaaaa	gaccctgtcc	ctcatggccc	gccactggc	ctcctgtgaa	60
ctctgtcctg	ttgccaaccc	cagatgaagt	cagccaaaaa	gtgctttcca	catcctctct	120
ctggggctgc	ccagcctgac	cgtaggggat	ccactggcag	agccaagggtg	gatgctgggtg	180
cctgaagctg	gaagccagca	ggacatgaga	cccctcctgt	agcaggaagt	ggttctagaa	240
ctcccagcag	aacagaacgg	aaaaggagct	gattggggat	agaatgagtt	ctgctaaaca	300
gccagatgct	ctgagagagg	tgacactyga	ctgtctcgga	ggtgtgtgca	gatggctaca	360
ggtgg						365

<210> 392
 <211> 302
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(302)
 <223> n = A,T,C or G

<400> 392						
ccaagagcta	caatgagcag	cgcatacanga	cagaacgtgc	aggtttttga	gttccagttg	60
actgcagagg	acatgaaagc	catagatggc	ctagacagaa	atctccacta	ttttaacagt	120
gatagttttg	ctagccaccc	taattatcca	tattcagatg	aatattaaca	tggagagctt	180
tgctgatgt	ctaccagaag	ccctgtgtgt	ggatggtgac	gcagaggacg	tctctatgcc	240
ggtgactgga	catatcacct	ctacttaaata	ccgtcctgtt	tagcgacttc	agtcaactac	300
ag						302

<210> 393
 <211> 213
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(213)

<223> n = A,T,C or G

<400> 393

ccaataatca agnacaaana ctggatttga ggatggatca gttctgaaac agtttctttc	60
tgaaacagag aaaatgtccc ctgaagacag agcaaaatgc tttggaaaga atgaggccat	120
acaggcagcc catgatgccg tggcacagga aggccaatgt cgggtagatg acaagggtgaa	180
tttccatttt attctgttta acaacgtgga tgg	213

<210> 394

<211> 334

<212> DNA

<213> Homo sapien

<400> 394

cctaccata atccagagag gcttgcccag aggaggacta cgtggggggac gtgccaccag	60
aaccctactt gggggcgga tgtcactccg aggtcaaaac ctgctccgag gtggacgagc	120
cgtagctccc cgaatgggct taagaagagg tgggtgttcga ggtcgtggag gtcctgggag	180
agggggccta gggcgtggag ctatgggtcg tggcggaatc ggtggttagag gtcgggggtat	240
gataggtcgg ggaagagggg gctttggagg ccgaggccga ggccgtggac gaggggagagg	300
tgcccttgct cgccctgtat tgaccaagga gcag	334

<210> 395

<211> 174

<212> DNA

<213> Homo sapien

<400> 395

ccagatgagg aaaaaaatta ggaaggagat gaagttttcc aaatttcatg gtatatgctg	60
cacttcccca accttcactc tccatgtagc ctactgggtc tactattcca caaagtggct	120
caacctccaa atgacctctg gtttaccctt attaaaatcc caaaggactt tcag	174

<210> 396

<211> 140

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(140)

<223> n = A,T,C or G

<400> 396

ctgcaaagcc ttgtgtaach ttctccagca tttggaccca gtacgtgaaa gccacaaca	60
cgttcattgt ctttagtatt acagattatt tttgcataac atttgttgtt atctcttgac	120
ggaatcgtcc attccaatgg	140

<210> 397

<211> 318

<212> DNA

<213> Homo sapien

<400> 397

cctcgctgg agggcccccg ggcagcacag ggaggacgag cttgtccagc agaggggtctg	60
gcagaggggt ccgcagaggt ttgggcaggg ggtctgacat ccctgggtcc tgctctggct	120
ctggctgccg ggatttgcac aggccaggt gcatacagat gccgtttgag tcagtctggt	180

tctggaagta gtcgatgacc agggggaagt agtcgtcaag cacttggttg cactggggca	240
tgagcagctt caaggggagg acgttgact cctgctccag gaacttcctc atcgtgtcct	300
ggaaaatggc ctccttgg	318

<210> 398

<211> 517

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(517)

<223> n = A,T,C or G

<400> 398

ccttntctcg ccattccattc atcgaccctc tccagcactt gctgcaggct tggctgacca	60
tccaccatgg cttgaataat cccggtgagc tctgtacaga atggggtaag ctgtggatgg	120
actacaggct ggacatacat gtgaaaggta gactcaatct ccatgggccg gccatttagc	180
tttaggatgg ggaactcgat gatttcctga ggatgaatct gtggcttgtc gcacgtggcc	240
tcaaagtcca gactaaaaa gtagtgatac ctctggagag ggaaggacac cattgccgcc	300
atggatgccc caaagccgtg ggccgccagc tttctggtgg atatggagca gaactccgga	360
acaccacagg gagaaaataa gtgggagccc agcacttttc ttgctcttga aagtaaatac	420
gaagaaaatc gagctgtctc agtctgtaaa ggtgctagca ttgaacatcc agaagcatct	480
aaaactctcc ttacttcgaa gatgccaaaga ccggcag	517

<210> 399

<211> 329

<212> DNA

<213> Homo sapien

<400> 399

ccaacctcag gcaacgggtg gagcagtttg ccagggcctt ccccatgcct gggtttgatg	60
agcattgaag gcacctggga aatgaggccc acagactcaa agttactctc ctcccccta	120
cctgggccag tgaaatagaa agcctttcta ttttttggtg cgggagggaa gacctctcac	180
ttagggaag agccaggtat agtctccctt cccagaattt gtaactgaga agatcttttc	240
tttttccttt tttcggtaac aagacttaga aggagggcc caggcacttc tgtttgaaac	300
cctgtcatga tcacagtgtc agagacgcg	329

<210> 400

<211> 451

<212> DNA

<213> Homo sapien

<400> 400

ctggcttcac tgctcagggtg attatcctga accatccagg ccaaataagc gccggctatg	60
cccctgtatt ggattgccac acggctcaca ttgcatgcaa gtttgctgag ctgaaggaaa	120
agattgatcg ccgttctggt aaaaagctgg aagatggccc taaattcttg aagtctggtg	180
atgctgccat tgttgatatg gttcctggca agcccatgtg tgttgagagc ttctcagact	240
atccaccttt gggctgcttt gctgttcgtg atatgagaca gacagttgcg gtgggtgtca	300
tcaaagcagt ggacaagaag ctgctggagc tggcaaggtc accaagtctg cccagaaagc	360
tcagaagcta aatgaatatt atccctaata cctgccaccc cactcttaat cagtgggtga	420
agaacggctc agaactgttt gtttcaattg g	451

<210> 401

<211> 180

<212> DNA

<213> Homo sapien

<400> 401

ccaggaagca	ggccagggga	ttggcagcac	tgcccagcac	cacagccagg	tggtaggcca	60
gacgcccgtg	gggtaagcag	gaaaagctct	gcacggcagg	cagcacgcca	ttggtcagcg	120
cgttggtggc	ggccaacagg	cccagcaggc	aggcactgcg	ggctgataga	agctgatagg	180

<210> 402

<211> 385

<212> DNA

<213> Homo sapien

<400> 402

ccaggccacc	tgtgcggggc	tcctcgatgt	ggaagggttcg	ggtgaggaga	ttgtagaagg	60
agccgtagca	cacggccacc	acagtgcacg	tgaggcagat	cacgttgtag	ggcatgctga	120
agtccggtgt	cggcagggtc	accagcagcg	gctccgtgta	gagccgcaca	aagtagttag	180
agccatcaga	gactgggaac	aggctgttga	agaggggact	ctcttcccag	tccactggct	240
tggctgctac	catgctgggc	acaagggcgc	tgaggacaga	tgggctgaca	tagaagccat	300
ggttaggatc	tggcgtgtac	tcgggtccact	tcagcagcgc	ccgctcaaac	tggatggaaa	360
ccttggtgac	tgagttggcc	ggcag				385

<210> 403

<211> 440

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (440)

<223> n = A,T,C or G

<400> 403

ctgtttaacc	agnaacccgg	ggggtcaccc	cccacagaat	gtacatgaaa	cactagagga	60
ctgcatgttt	ttccctgaga	gaagcgtaag	acaaacagaa	gtcaaaaagt	agtcactggg	120
agcgccatcc	ttctaagcaa	atcctccctt	tcccttttgg	aggatttgcc	cgaactacgt	180
agccagtcag	cacttagacc	acctgcctcc	tccccccct	ataaacccac	cactcccttc	240
ctcctttccc	aaaccacttg	gggtgtccta	agccctcact	gccccaaagg	caaaatatca	300
gctaagatcc	ttgtcagtat	ttccacagtc	atacctaattg	aattgggaag	tggggccctt	360
aaaaaccaat	tcacatctat	gcacttgttt	ccactggatt	tggcagacag	gcttttttag	420
ttaccgtaac	cagatcttaa					440

<210> 404

<211> 239

<212> DNA

<213> Homo sapien

<400> 404

cctacgaaaa	actccccggc	ggtgaagaga	acgtcagtgc	catccagcgt	cgcgtttctcg	60
tctcctattt	ccacaattcg	gagccccagg	tcttgagggg	ctttgcggac	tccatcgacc	120
tctggcctac	gagcggggct	ccagggccgc	gtgattaggg	ccgtgtcccc	ttggatcacg	180
gccgtgtcgc	caagcagcgg	tcccagcggc	aatgactcct	caggtggcag	ttctagcag	239

<210> 405

<211> 261

<212> DNA

<213> Homo sapien

<400> 405

ctggagagggc agcccttcac cggatgcccc gctccgtgcc cctgcggggc ccagcacagt	60
ttaccttctc cccccacggc ggtcccatct actctgtgag ctgttcccc ttccacagga	120
atctcttctt gagcgctggg actgacgggc atgtccacct gtactccatg ctgcaggccc	180
ctcccttgac ttcgctgcag ctctccctca agtatctgtt tgctgtgcgc tgggtcccag	240
tgcggccctt ggtttttgca g	261

<210> 406

<211> 641

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (641)

<223> n = A,T,C or G

<400> 406

ctgctccccg gcntggtggc agcaagtaga catcgggcct gtgcagggcc acccccttgg	60
gccgggagat ggtctgcttc agtggcgagg gcaggctgt gtgggtcacg gtgcacgtga	120
acctctcccc ggaattccag tcactctcgc agatgctggc ctaccccacg gcgctgaaag	180
tggcattggg gtggctctcg gagatgttgg tgtgggtttt cacagcttcg ccattctggc	240
gggtccagga gatggtcacg ctgtcatagg tggtcaggtc tgtgaccagg cagggtcaact	300
tgggtggactt ggtgaggaag atgctggcaa aggatggggg gatggcgaag acccggatgg	360
ctgtgtcttg atcggggaca cacatggagg acgcattctg ctggaaggtc aggccctgt	420
gateccacgc gcagggtgaac atgctctggc tgagccagtc gctctctttg atggtcagt	480
tgtgtgtcac cttgtaggtc gtgggcccag actctttggc ctacgcctgc acctgggtccg	540
tgggtgacgc agaccccacc tgcttccct cgcgcagcca ggacacctga atctgccggg	600
gactgaaacc cgtggcctgg cagatgagct tggacttgcg g	641

<210> 407

<211> 173

<212> DNA

<213> Homo sapien

<400> 407

ccagggtactg gcacaatcat gtctggatgg ggggtggtgg gtctgtagg cagagaaaca	60
ggaaattgtc gtagtcagta tcgagcagc tggcctcggt cgccaccgta tagttgatct	120
tgaacttctt tggattctca gtcttctctc caaggacctt cttctcaaca cag	173

<210> 408

<211> 165

<212> DNA

<213> Homo sapien

<400> 408

ccactgtctg cagccatggc agaaagtgtc caaagtccag caccttcaca ttcattctcat	60
cactcttggg gttccccagg accttgagca cctcggcggt ggtagggttc tggcccagg	120
ccctcatcac atccccacac tggctgtaca ggaatttgcc atcac	165

<210> 409

<211> 329

<212> DNA

<213> Homo sapien

<400> 409

ctgtagcttc	tgtgggactt	ccactgctca	ggcgtcaggc	tcagatagct	gctggccgcg	60
tacttggtgt	tgctttgttt	ggaggggtgtg	gtgggtctcca	ctcccgctt	gacggggctg	120
ctatctgcct	tccaggccac	tgtcacggct	cccgggtaga	agtcacctat	gagacacacc	180
agtgtggcct	tggtggcttg	aagctcctca	gaggagggcg	ggaacagagt	gaccgagggg	240
gcagccttgg	gctgaccaag	gacggtcage	ttggtccttc	cgccaaatac	cgccggataa	300
gcaccactgt	tgtctgctga	ttgacagaa				329

<210> 410

<211> 235

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(235)

<223> n = A,T,C or G

<400> 410

ccatcagnga	gaaaggtggt	tgtcagttgt	ttcacaaacc	agattgagga	ggacaaactg	60
ctctgccaat	ttctggattt	ctttattttc	agcaaacact	ttctttaaag	cttgactgtg	120
tgggcactca	tccaagtgat	gaataatcat	caagggtttg	ttgcttgtct	tggatttata	180
tagagctttt	tcatatgtct	gagtccagat	gagttggtca	ccccaacctc	tggag	235

<210> 411

<211> 294

<212> DNA

<213> Homo sapien

<400> 411

aattaagggg	agatgaagat	gataaaacag	ttttggatct	tgctgtgggt	ttgtttgaaa	60
cagcaacgct	tcggtcagg	tatcttttac	cagacactaa	agcatatgga	gatagaatag	120
aaagaatgct	tcgcctcagt	ttgaacattg	accctgatgc	aaaggtggaa	gaagagcctg	180
aagaagaacc	tgaagagaca	gcagaagaca	caacagaaga	cacagagcaa	gacgaagatg	240
aagaaatgga	tgtgggaaca	gatgaagaag	aagaaacagc	aaaggaatct	acag	294

<210> 412

<211> 433

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(433)

<223> n = A,T,C or G

<400> 412

cctgagaagc	cagaggcagg	tggagagggg	gtggaaagtg	agcagcgggc	tgggctggag	60
ccgcacacgc	tctcctccca	tggtaaatag	cacctttaga	aaaattcaca	agtccccatc	120
cacaaaaaaaa	aaaanaanaa	aaatttcagg	gantaaaaat	anactttgaa	caaaaaggaa	180
catttgntgg	cctggggggg	catctnantt	tntntagcnc	cagngattcc	ctccccnccc	240
cacccatcac	atanatgtaa	cacctttggt	ntaaaatggg	gagccgtttc	caccntgccc	300

ccntccccgc	ccccaggcag	ttgccccggn	gacacntcaa	gacaggancg	aggtagtntt	360
tcancancac	agttncacaa	ggaacagaac	agtntctccc	gccagccct	gcggcacaag	420
ggattgacac	gcn					433

<210> 413
 <211> 494
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(494)
 <223> n = A,T,C or G

<400> 413						
ccttatttct	cttgtcnctt	cgtacagga	ggaatttgaa	gtagatagaa	accgacctgg	60
attactccgg	tctgaactca	gatcacgtag	gactttaatc	gttgaacaaa	cgaaccttta	120
atagcggctg	caccatcggg	atgtcctgat	ccaacatcga	ggtcgtaaac	cctattgttg	180
atatggactc	tagaatagga	ttgcgctgtt	atccctaggg	taacttgttc	cgttgggtcaa	240
gttattggat	caattgagta	tagtagttcg	ctttgactgg	tgaagtctta	gcatgtactg	300
ctcggagggt	gggttctgct	ccgaggtcgc	cccaaccgaa	atttttaatg	cagggttggt	360
agtttaggac	ctgtgggttt	gttaggtact	gtttgcatta	ataaattaaa	gctccatagg	420
gtcttctcgt	cttgctgtgt	tatgcccgcc	tcttcacggg	cagggtcaatt	tcactgggtta	480
aaagtaagag	acag					494

<210> 414
 <211> 294
 <212> DNA
 <213> Homo sapien

<400> 414						
ctgggaggat	agcaccgggc	atattttgga	atggatgagg	tctggcaccc	tgagcagtc	60
agcgaggact	tggctctagt	tgagcaattt	ggctaggagg	atagtatgca	gcacggttct	120
gagtcgtgtg	gatagctgcc	atgaagtaac	ctgaaggagg	tgctggctgg	taggggttga	180
ttacaggggt	gggaacagct	cgtacacctg	ccattctctg	catatactgg	ttagtgagggt	240
gagcctggcg	ctcttctttg	cgctgagcta	aagctacata	caatggcctt	gtgg	294

<210> 415
 <211> 421
 <212> DNA
 <213> Homo sapien

<400> 415						
ccttgcccct	gccctccac	gaatgggttaa	tatatatgta	gatatatatt	ttagcagtga	60
cattcccaga	gagccccaga	gctctcaagc	tcctttctgt	caggggtggg	ggttcagcct	120
gtcctgtcac	ctctgagggtg	cctgctggca	tccttccccc	catgcttact	aatacattcc	180
cttccccata	gccatcaaaa	ctggaccaac	tggcctcttc	ctttcccctg	ggacaaaaat	240
ttaggggcct	cagtcctca	ccgccatgcc	ctggcctatt	ctgtctctcc	ttcttcccc	300
tggcctgttc	tgtctctgag	ctctgtgtcc	tcggttcatt	ccatggctgg	gagtcactga	360
tgctgcctct	gccttctgat	gctggactgg	ccttgcttct	acaagtatgc	ttctcccaca	420
g						421

<210> 416
 <211> 342
 <212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(342)

<223> n = A,T,C or G

<400> 416

ccacttttctt	tcccacnctg	gaaggcggca	tctatgactt	cattggggag	ttcatgaagg	60
ccagcgtgga	tgtggcagac	ctgataggtc	taaaccttgt	catgtcccgg	aatgccggca	120
agggagagta	caagatcatg	gttgctgccc	tgggctgggc	cactgctgag	cttattatgt	180
cccgtgcac	tcccctatgg	gtcggagccc	ggggcattga	gtttgactgg	aagtacatcc	240
agatgagcat	agactccaac	atcagtctgg	tccattacat	cgtcgcgtct	gctcaggtct	300
ggatgataac	acgctatgat	ctgtaccaca	ccttccggcc	gg		342

<210> 417

<211> 389

<212> DNA

<213> Homo sapien

<400> 417

tattaattag	gttcttaaga	catttagaac	accaatttgt	gaggataaat	tccattcgctc	60
agagcaaaca	cagatcgag	gtagccctgg	agctgaggaa	tagctttgat	ttttggtaaa	120
atattgtagt	ccacagcttt	ctgatcaatc	ttgcgtgct	ccgtaatctc	atatttctct	180
ttttctgtgt	cgaagatctc	accttccctgg	tgtctgggct	tccgcagctt	cttcttcttg	240
aagtaagcat	cagtaagatg	ttttgggatt	tttacattgc	tgataatcgat	tttggttgaa	300
gtggcaatga	caaatttctg	gtgtgttctt	cgtagaggaa	ctcgattgag	gaccagaggt	360
ccagtcacaa	gtaataagcc	actagccag				389

<210> 418

<211> 343

<212> DNA

<213> Homo sapien

<400> 418

gtgggaggga	gccaggttgg	gatggaggga	gtttacagga	agcagacagg	gccaacgtcg	60
aagccgaatt	cctggtctgg	ggcaccaacg	tccaaggggg	ccacatcgat	gatgggcagg	120
cgggaggtct	tggtggtttt	gtattcaatc	actgtcttgc	cccaggctcc	ggtgtgactc	180
gtgcagccat	cgacagtgac	gctgtagggt	aagcggctgt	tgccctcggc	gcggatctcg	240
atctcgttgg	agccctggag	gagcagggcc	ttcttgaggt	tgccagtctg	ctggtccatg	300
taggccacgc	tgtttttgca	gtggtagggt	atgttctggg	agg		343

<210> 419

<211> 255

<212> DNA

<213> Homo sapien

<400> 419

cctagcaaga	gaatcaccaa	atztatggag	agttaacagg	ggtttaacag	gaaggaagtg	60
ccttttagtaa	gttctcaagc	cagaggctgg	aggcagcagc	taaatacagag	gacagcatcc	120
tcagtgaag	tgagccattc	ggggtggcat	gtcactccag	gaataaacac	aacttagaaa	180
caaatgattt	cgtaggatag	cacagtgaca	tggtgcactg	tgaacctgag	gccactgtgt	240
caaactgtgc	actgg					255

<210> 420

<211> 261
 <212> DNA
 <213> Homo sapien

<400> 420
 cttctgatga taaccaaccc ctagctacca ctctgtattc atcaggggag ggggtataaac 60
 cccacatgca agaagaaccc ttgccccag tgtcaaatgg gatggggatg ctagagttat 120
 agtaaagggg aaaccctatg taagctgtta acagagttca caggggtagg gataaccct 180
 gttctccagc tcccaaagt gtcactttc ccagcttctt catccgttca tcaatgctgg 240
 caaagttccc ctcaactgtg g 261

<210> 421
 <211> 179
 <212> DNA
 <213> Homo sapien

<400> 421
 ccttcctggt gttgtttcaa atgctgcttg atttctcgta acagatctgc atctatgtaa 60
 tacctttctt cagatctgac tgctccaaaa tgattctgca tcttgatttg agacatcaat 120
 tcatttagtc ggcccttgaa ctgagtaggt gcatttagtt caccctgaat cgtatccag 179

<210> 422
 <211> 424
 <212> DNA
 <213> Homo sapien

<400> 422
 cgagggtccaa atctgatctg cagatgcaga agattcgaca gaagctgcag actaaacagg 60
 ctgccatgga gaggtctgga aaagctaagc aactgcgagc acttaggaaa tacgggaaga 120
 aggtgcaaac ggaggttctt cagaagaggc agcaggagaa agcccatatg atgaatgcta 180
 ttaagaaata tcagaaaggc ttctctgata aactggattt ccttgaggga gatcagaaac 240
 ctctggcaca gcacaagaag gcaggagcca aaggccagca gatgaggaag gggcccagtg 300
 ctaaacgacg gtataaaaac cagaagtttg gttttggtgg aaagaagaaa ggctcaaagt 360
 ggaacactcg ggagagctat gatgatgtat ctagcttccg ggccaagaca gctcatggca 420
 gagg 424

<210> 423
 <211> 256
 <212> DNA
 <213> Homo sapien

<400> 423
 ctgtggccta gggctacctc aagactcacc tcataccttac cgcacattta aggcgccatt 60
 gcttttgagg gactggaaaa gggaagggtga ctgaaggctg tcaggattct tcaaggagaa 120
 tgaatactgg gaatcaagac aagactatac cttatccata ggcgcagggtg cacaggggga 180
 ggccataaag atcaaacatg catggatggg tcctcacgca gacacacca cagaaggaca 240
 ctagcctgtg cacgcg 256

<210> 424
 <211> 330
 <212> DNA
 <213> Homo sapien

<400> 424
 ccagccgcat gggagtggag gcagtcacg ccttgctaga ggccaccccg gacacccag 60

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cttgcgctcgt gtcactgaac gggaaccacg ccgtgcgccct gccgctgatg gagtgcgtgc      120
agatgactca ggatgtgcag aaggcgatgg acgagaggag atttcaagat gcggttcgac      180
tccgagggag gagctttgcg ggcaacctga acacctacaa gcgacttgcc atcaagctgc      240
cggatgatca gatcccaaag accaattgca acgtagctgt catcaacgtg ggggcacccg      300
cggctgggat gaacgcggcc gtacgctcag                                     330

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<210> 425
<211> 333
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(333)
<223> n = A,T,C or G

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<400> 425
ctgctccatg gnctcaaagt cagcaccacc cacacccaca atgatcactg acatgggcag      60
gttcgaggca cgcaccacag cctcacgtgt ggcttcacag caccatcagt      120
cagnagaaac agnatgaagt attgngaggc antccctga tgtgcagcct gggctgcaaa      180
cctggacctg cccgggcggc cgctcgaaag ggcgaaattcc agcacactgg cggccgttac      240
tagnggatnc aganctcggg acnaagcttg gcagtaatca tggtcatagc tgtttcctgt      300
gagcggntgg gatgaacgcg gccgtacgct cat                                     333

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<210> 426
<211> 411
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1)...(411)
<223> n = A,T,C or G

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```

<400> 426
gggtgttcat catgaggatt gcttctgcc a tggagctgat ggacgtgggc aggttgctga      60
gaaggtgggg tggaaagtga tgccgggggt ggggtgagtgc cctggctctg ttcatagggg      120
agcctttccc tagcagtgga acgctgtggt cattttctct agcatattcc cttgggaagt      180
ctagatttgc tattaatctg gctgagaatc taagttctgt gccttagaga cagtttgcac      240
tttcccatat tgtgcctggg acagccatat gatttttttt cccaccaaac aagtatgcaa      300
acagaaacca gttcaaaggg ggatgggtga aaagatgagg cagtanaaat gcctttgaat      360
ggttttctgt agctaattct ctttaaattt tgtcctgctt tttttcttta t                                     411

```

```

<210> 427
<211> 450
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(450)
<223> n = A,T,C or G

```

```

<400> 427
acgtgtacaa gtttgaactg gatacctctg aaagaaagat tgaatttgac tctgcctctg      60

```

```

gcacctacac tctctactta atcattggag atgccacttt gaagaaccca atcctctgga      120
atgtggctga tgtggncatc aagttccctg aggaagaagc tccctcgact gtcttggtccc      180
agaacctttt cactccaaaa caggaaattc agcacctgtt ccgcgagcct gagaagaggc      240
ccccaccgtt ggtgtccaat acattcactg ccctgatcct ctgcgcgttg cttctgctct      300
tcgctctgtg gatccggatt ggtgccaatg tctccaactt cacttttgct cctagcacga      360
ttatatattc cctgggacat gctgctatgc tgggactcat gtatgtctac tggactcagc      420
tcaacatggt ccagacctg aagtacctgg                                     450

```

<210> 428

<211> 377

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(377)

<223> n = A,T,C or G

<400> 428

```

cagggtctata gtgcgctatg ttgatctggt gttcatgcta agttccgcat caatatgggtg      60
acttcttggg agtgggggac caccagggtg cctaaggagg ggtgaacctg cctacgttgg      120
aaatagagct ggncaaaact cctgtgctca tcagtagtag aattgcacct gtgaatagcc      180
nccgccctcc agcatgggca acataacaag accctgcctc ttaaagataa aaattggaaa      240
acactngtag gaaaaaaaagg gtgnttggtc taaataaatn tggattgggn ataaatgacn      300
caaaactatc atgaatttga aagcntttct aatttcttga aagtctgaaa aaagttaaan      360
cncaatttta tctnaaa                                     377

```

<210> 429

<211> 206

<212> DNA

<213> Homo sapien

<400> 429

```

gttgctcctc caaagaagggt tggcttcaag gccgtgtcca gggacccacg agcagaggca      60
ctgggggggca agggatctcc aaggggggcaa gggatcccta aagggggtag ctcacagggtg      120
aggggggttta gggccctctt agggagcgcc tgaggccata cattcaagag tgtccctgggt      180
gaggcccgagg gaagagccag gactgg                                     206

```

<210> 430

<211> 473

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(473)

<223> n = A,T,C or G

<400> 430

```

ccttatttnt cttgtccttt cgtacagggg ggaatttgaa gtagatagaa accgacctgg      60
attactccgg tctgaactca gatcacgtag gacttttaac gttgaacaaa cgaaccttta      120
atagcggctg caccatcggt atgtcctgat ccaacatcga ggtcgtaaac cctattgttg      180
atatggactc tagaatagga ttgcgctgtt atccctagggt taacttggtc cgttgggtcaa      240
gttattggat caattgagta tagtagttcg ctttgactgg tgaagtctta gcatgtactg      300
ctcggagggtt gggttctgct ccgagggtcnc cccanccgaa atttttaatg cagggttgggt      360

```

```

agntnaggac ctgtggggttt gttaggtact ggggtgcatta ataaattaaa gtcctatagg      420
gtcttctcgt cttgctgtgt tatgcccnc tcttcacggg cagggtcaatt tca                473

```

```

<210> 431
<211> 215
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(215)
<223> n = A,T,C or G

```

```

<400> 431
cctgtatnaa gctanaaaaa gactaccagc ccgggatcac cttcatcgtg gtgcagaaga      60
ggcaccacac ccggctcttc tgcactgaca agaacgagcg gggtgggaaa agtggaaaca      120
ttccagcagg cagcactgtg gacacgaaaa tcacccaccc caccgagttc gacttctacc      180
tgtgtagtca cgctggcatc caggggacaa gcagg                                     215

```

```

<210> 432
<211> 391
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(391)
<223> n = A,T,C or G

```

```

<400> 432
ccagcactgc cacaaacttt ttcagggcca ccaggcgctg cccttccagg accgggaacc      60
tgcccacttc tatccgcagg atgtagtga gtgcagattc caggtcagcc atgtagatcc      120
tggagcgatc tgccaatttc caaacagtgg gagctatctt gttagcagtg gttggtgcaa      180
ctgtggtctg ggcagcctcc ctggtgagcc cagagagtct ctgcaggtaa gcggtataga      240
aggacctgga ttccatgagc acggggactc gggagacgga gccattccgg aacagcaggt      300
agcaagaggg gaagtcgggtg acaccaaact ttctcaccac attggcctct gtgttcagca      360
ccctgcgcac cgccacncct ttgtgctggg a                                     391

```

```

<210> 433
<211> 420
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(420)
<223> n = A,T,C or G

```

```

<400> 433
ctgtagcttc tgtgggactt ccactgctca ggcgtcaggc tcagatagct gctggctgcg      60
tacttggtgt tgctttgttt ggaggggtgt gtggtctcca ctccgcctt gacggggctg      120
ctatctgcct tccaggccac tgtcacggct cccgggtaga agtcacttat gagacacacc      180
agtgtggcct tgttggtctg aagctcctca gaggagggcg ggaacagagt gaccgagggg      240
gcagccttgg gctgacgtag gacgggttagt ttggnccctc cgccgaatgc cgcanttcta      300
ctgtcccaca cctgacagta atagtcancc tcattctcgg cttgggctct gctgatggtc      360

```

agggtggccc gtgntccccg agttggagcc agggaatcnc tcagggatcc canagggccn 420

<210> 434
 <211> 239
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(239)
 <223> n = A,T,C or G

<400> 434
 ccaaccanga gagaagggat cgcttggtgc ccaggggcca ccaggagctc caggcccact 60
 tgggattgct gggatcactg gagcacgggg tcttgcagga ccaccaggca tgccagggtcc 120
 taggggaagc cctggccctc aggggtgtcaa gggtgaaagt gggaaaccag gagctaacgg 180
 tctcagtgga gaacgtggnc cccctggacc ccagggtctt cctgggtctgg ctggtnacg 239

<210> 435
 <211> 415
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(415)
 <223> n = A,T,C or G

<400> 435
 ctgtccaatg gcaacaggac cctcactcta ttcaatgtca caagaaatga cgcaagagcc 60
 tatgtatgtg gaatccanaa ctcaagttagt gcaaaccgca gtgacccagt caccctggat 120
 gtcctctatg ggccggacac ccccatcatt tcccccccag actcgtctta cctttcggga 180
 gcaaacctca acctctctg ccaactcgcc tetaacccat cccncanta ttcttgccgt 240
 atcaatggga taccgcagca acacacacaa gttctnttta tcgccaaaat cagccaaaat 300
 aataacggga cctatgcctg tttagggntn taacttggt actggccgca anaattccat 360
 agtcaagagc atcacagnct ctgcatntgg aacttctcct ggctntcaga cctgn 415

<210> 436
 <211> 152
 <212> DNA
 <213> Homo sapien

<400> 436
 ccaggattga caggccatcc attcacagcc aggagatgct gggccagtcc ctccaagagg 60
 tctccgtcat ggcagtgatg aaaacctaac aggggtggccc cctgtgccag ctcaagggtac 120
 tggagcccga gggcctgaca ggttcccagc ag 152

<210> 437
 <211> 174
 <212> DNA
 <213> Homo sapien

<400> 437
 ccagggtactg gcacatcatg ctctggatgg ggggtgggtgt gtctgtgaag cagagaaaca 60
 ggaaattgtc gtagtcagta tcgagcagct gtggcctcgt tcgccaccgt atagttgatc 120

ttgaacttct ttggattctc agtcttctct ccaaggacct tcttctcaac acag 174

<210> 438
 <211> 485
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(485)
 <223> n = A,T,C or G

<400> 438
 ccacggccct ctcggccctc tcgctgggag .cggagcagcg aacagaatcc atcattcacc 60
 gggctctcta ctatgacttg atcagcagcc cagacatcca tggtagctat aaggagctcc 120
 ttgacacggg caccgcccc cagaagaacc tcaagagtgc ctcccggatc gtctttgaga 180
 agaagctgcg cataaaatcc agctttgtgg cacctctgga aaagtcatat gggaccaggc 240
 ccagagtcct gacgggcaac cctcgcttgg acctgcaaga gatcaacaac tgggtgcagg 300
 cgcagatgaa aggggaagctc gccnggtcca caaaggaaat tcccgatgag atcagcattc 360
 tccttctcgg ngtggcgcac ttcaaggggc agngggtaac aaagtttgac tncagaaang 420
 acttcctcgc aggatttcta cttggatgaa gagaggaccg tgaggggtccc catgatgtcg 480
 gaccc 485

<210> 439
 <211> 317
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(317)
 <223> n = A,T,C or G

<400> 439
 gggccgtctt cccctccatc gtggggcgcc ccaggcacca gggcagtgat ggtgggcatg 60
 ggtcagaagg attcctatgt gggcgacgag gccagagca agagaggcat cctcaccctg 120
 aagtacccca tcgagcacgg catcgncacc aactgggacg acatggagaa aatctggcac 180
 cacaccttct acaatgagct gcgtgtggct cccgaggagc acccctgtgt gctgaccgag 240
 gccccctga accccaaggc caaccgcnag aagatgacct agatcatgtt tgagaccttc 300
 agcaccocag ccatgta 317

<210> 440
 <211> 338
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(338)
 <223> n = A,T,C or G

<400> 440
 ccanaaagac ttcccaggga agatgcttgg ctctctgctc caagggtgggc catggtatag 60
 gggcctcgaa gggcttgtgg ctgggggtgat cccagggggc attgctcaaa gtgcacagga 120
 ggtggcagca gggtcaggcg agttcctgtt ccaggacat caggagggag ggtagaagcc 180

tagggagtgt gcgaggctgc tgggatgagg gagctcaggg gctaccagct aaccagcctc	240
agctcaatgg tttctccatc cttgggtctg tagtcagcaa taccttgcaa cagtgggggtg	300
ttgggggtctc ggagaagctg ccagaactcc ctttctcc	338

<210> 441
 <211> 505
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(505)
 <223> n = A,T,C or G

<400> 441	
ccacacagan tcaccaagcc acagacttgt cttccacaag cacgttctta tcttagccac	60
gaagtgacca agccacacgt actaaagggt gaactcaaag atatgtacag ggtattaaac	120
aaataccaag gggaacagtt aacttcaata caaggctcga atcagcaaca agttctacaa	180
tccagnctg atatcagata caagcttcaa ggacaatttc ttttcgaagg cttattccag	240
tttcgngagg ctagcatgag gtgtgtgcat ttgccagggg caaatttcta ttctcaatta	300
acccatgcag caaatgctac ncatgggtgcn gagtccgttt agaagcattt gcggtggacg	360
atggaggggc ccgactcgtc ttactcctgc ttgctaattc acnngngctg gaaggnggac	420
agtgaggcca cggatggagc caccnatcca caccgagtnc ttgcgctctg ggggtgcgat	480
natnttgatc ttcattggtgc tgggc	505

<210> 442
 <211> 386
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(386)
 <223> n = A,T,C or G

<400> 442	
cgccaggtga tacctccgcc ggtgaccag gggctctgag acacaaggag tctgcatgtc	60
taagtgttag acatgtctag ctttgtggat acgcggactt tgttgctgct tgcagtaacc	120
ttatgcctag caacatgcca atctttacaa gaggaaccg taagaaaggg ccagccgga	180
gatagaggac cacgtggaga aaggggtcca ccaggcccc caggcagaga tggatgaagat	240
ggtcccacag gccctcctgg tccacctggt cctcctggcc cccctggtct cgatgggaac	300
tttgctgctc agtatgatgg aaaaggagg nggacttggc cctggaccaa tgggcttaat	360
gggacctana ggccacactg gtgcag	386

<210> 443
 <211> 404
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(404)
 <223> n = A,T,C or G

<400> 443

```

cctccctctc agagcttgcc ccagggactc tctggccctc agggttcaat gtattctgac      60
caaggccaag ctttctctggg gctcagggaa aatcacactt tgctaccoga agctgtatcc     120
cctcagatgc caggaaggcc gtgatcatct gactccaccc tcctgagaca cattctctcc     180
ctgactgtcc tgttctaagt cagcggagca ccttaggatg gaggggtgga ggcgaggcca     240
ngatgcagcc tctgtgaaca ggtgcctgga ggctgggaaa tgaccctgag agggcaggac     300
acagcnaccg ngggcttaag gtgagggngg agagcaagnt tggcccaact tacaattcta     360
gntcagagcc ancccctaac atggngggca tttattcatt tcgg                          404

```

```

<210> 444
<211> 318
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(318)
<223> n = A,T,C or G

```

```

<400> 444
catgggctat agtgcgctat gttgatctgg tgttcatgct aagttccgca tcaatatngc      60
gacttcttng gagtggggga ccaccangtt gcctaaggag ggggtgaacct gcctacgttg     120
gaaatagagc tgggtcaaaac tcctgtgctc atcagtagta gaattgcacc tgtgaatagc     180
caccgccctc cagcntgggc aacatagcaa gaccctgcct cttaagataa aaattggaaa     240
acactgggtan gaaaaaaagg ctgtttggtc taaanaagtc tggatngggg ataaatgaca     300
cnaanctatc atgactnt                          318

```

```

<210> 445
<211> 418
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(418)
<223> n = A,T,C or G

```

```

<400> 445
ccagtccaac ctgctcctca ttattgtata aatgagcaga atcaatatgg cggaagccag      60
cttcaattgc caatttggtg gcctctaaag ctttactttt aggaacctct gcaggcgcac     120
aggtgccaaa tcccaggaca ggcataaggt gaccatcatt cagcttcaca cactgatatt     180
tcgaatccat ttctgtcact agcctggctg gcaaagtgtt ctttcttccct cctcacagg     240
ctataagagc aatgagctgg caacgccccct gagcacactg tctgctgntt aaccaatggc     300
atgtgagagg agggacagag gcagtcttac acaagctgtg ataaaaattg catncagttc     360
aaccagtttc ttacnttatt ctaatgngna ggaagtgtgn gaagagcaca aagtcaga       418

```

```

<210> 446
<211> 361
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(361)
<223> n = A,T,C or G

```

<400> 446
 ctgtccaatn acaacaggac cctcactcta ctcagtgtca caaggaatga tgtaggaccc 60
 tatgagtgtg gaatccanaa cgaattaant gttgaccaca gcgacccagt catectgaat 120
 gtcctctatg gccagacga cccacacntt tccccctcat acacctatta ccgtccaggg 180
 gtgaacctca gcntctcctg ncatgcagcc tctaaccacac ctgcacagta tctttggctg 240
 attgatggga acntccagna acacnacaca agagctcttt atctccancn tnaactganaa 300
 gaacagcgcg actctatncc ttccaggggg ggggggtggg gnntgnggac cttncggggc 360
 c 361

<210> 447
 <211> 321
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(321)
 <223> n = A,T,C or G

<400> 447
 ccagganant gggtcccaaa aggggacctc acccgccccg agctctggag ccgctgacgc 60
 tcgcatccag gacatttgag atgggaatcc aaataggcta cttgnaaaag acgtgctgca 120
 ngcagccctg gagagactca tggagtcat tgtacattac tccatctacc gaggcagcgc 180
 atggcatgac tnaacggctt gnaacaaaca canaaattac caccacaaac attcaggaac 240
 caaatataat ctgctatggg cacaccacag acaatgcagg aagaggcttt ttattgctng 300
 ngtngtnttt caaatcatgt t 321

<210> 448
 <211> 325
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(325)
 <223> n = A,T,C or G

<400> 448
 ccagcttcaa ctttttagta tagaagatac aggatcacaa aaaggagact acgctttgca 60
 aacatagcat caaaattcaa cttttctctt tgcagtttat ccatggngtc agcatacctt 120
 gcaagggaag ctacttacat caaataactt ttctatatac atttccctcat tgaccttttc 180
 tcaaagaata tcttggtttt gccgaacaaa cataatatag gngtctgccg gatccattcc 240
 tggtttctgt ngtgaaggaa aagcaggggg aacaaaataa tatcaggggc tcaatngtga 300
 nattattatt taatcatacc ctgan 325

<210> 449
 <211> 123
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(123)
 <223> n = A,T,C or G

<400> 449
 cattaatntt ggaagcgatg gtgtggatta catcagtgtt agggcatggg gtggatatta 60
 ttacattann attggaagcg atgggtgtgga ttacatcagt gatagggcac ggtgtggata 120
 tta 123

<210> 450
 <211> 328
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (328)
 <223> n = A,T,C or G

<400> 450
 ctggcaatnt tgagctgccg gttatacacc aaaatgttct gttcagtacc tagctctgct 60
 cttttatatt gctttaaatt tttaaagaaa ttatattgca tggatgtggg tatttgtgca 120
 tattttttta caatgcccaa tctgtatgaa taatgtaaac ttcgattttt ttttaaaaaa 180
 attagatntt agctggagct ttgactaat gttaaagtaa tgccaaacta ccgacttgat 240
 ngggatgttt ttgtaangtt aattttctaa gactttttca catccaaagt gatgctttgc 300
 tttgggtttt aactgtttca acntnggn 328

<210> 451
 <211> 209
 <212> DNA
 <213> Homo sapien

<400> 451
 ctgccttgtt tcaacagaca tgcaaagatc ctaggagaca gtcccatag accttcagac 60
 attaaaaag gagccgtaca gtttgtttga agcacttcgt cttaccatt tatgcagggg 120
 cccagggaaa cttacacaca gccagaatga gggtcccaaa ggacttacat taattatggc 180
 tcttgcttcc tttcacaaat gagctgagg 209

<210> 452
 <211> 457
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (457)
 <223> n = A,T,C or G

<400> 452
 ctgtctantc ccttcaagag ctgtttatag aagcttgaga atggggtaaa aatttctgct 60
 agcaaaatca agttcttttt gaaattttat cagtaatcca gaatttagta gtccatgcct 120
 tctcactcag catttagaaa taaaaatgtg gtttcttaaa cgtatatacct ttcattgata 180
 tttccacatt tttgtgcttg gatataagat gtatttcttg tagtgaagtt gttttgtaat 240
 ctactttgta tacattctaa ttatattatt tttctatgta ttttaaatgn atatggctgt 300
 ttaatctttg aagcattttg ggcttaagat tgccagcacc acacatcaga tgcagtcatt 360
 gttgctatca gtgtggaatc tgatagagtc tngactccgg ccacttgagg ttgtgnactc 420
 caaagctaag gacagtgatg aggaagatgg catgtgg 457

<210> 453

<211> 277
 <212> DNA
 <213> Homo sapien

<400> 453
 ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
 agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
 atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
 gcatacagga ctaggaagca gataaggaaa atgactacga gggcgtgatc atgaaagggtg 240
 ataagctctt ctatgatagg ggaagtagcg tcttgta 277

<210> 454
 <211> 198
 <212> DNA
 <213> Homo sapien

<400> 454
 gttaaaagat agtaggggga tgatgctaata aatcaggctg tgggtgggtg tgttgattca 60
 aattatgtgt tttttggaga gtcattgtcag ttgtagtaata ataattgttg ggacgattag 120
 ttttagcatt ggagtaggtt taggttatgt acgtagtcta ggccatatgt gttggagatt 180
 gagactagta gggctagg 198

<210> 455
 <211> 608
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(608)
 <223> n = A,T,C or G

<400> 455
 ctgagcaagc taaggaccag gggcaactag accctaataa tngtacttt tgaaaatgat 60
 acaaactacc ttggttgtaa gaagtgcagg ttgaacactt taggagaaca gtcttcaaac 120
 tggcaattca aaatttccca ttatatgtga ataaaattgg aaggatgtta aatgtccatg 180
 gaaagttact cttgtaagtt aggatgcctt atactgaggc tttanaatga aagtacactt 240
 cacaatgga atagtgaaca taaattacca gaagtcaaga taatagtcac actagtaagg 300
 taagcaaggt aaattccctt atacacaaaa attattttga tgaccttttt caataatgaa 360
 tctgaaatga agtgttttaa aaagctccct aaacacaaaa cgaacataaa actgcttaac 420
 aacttttagag ctcatgtaac attcttgctg aaaacagtta ctgaaattac cagcgaaatg 480
 atggaatata tttaaagcag gncactcngt ataactctgga ataatttcat ttgctaactt 540
 ttaagaagta ttctctggac tataaatcctt gggcaaatac acttccactt tattattacc 600
 ccaaatta 608

<210> 456
 <211> 467
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(467)
 <223> n = A,T,C or G

```

<400> 456
cctggacctg tgtaaaccctt caaacactct tttttacatt aggtcgtgaa gttaaatttt      60
ttactgtttc tgtgctacag actcttcaaa gggaaatagt taagtcaatt tcaaagaaaa      120
tgaccagcac atttttaaaa cattagaaat gatttgactt tgactatcta ctgccaaaaa      180
aagggttaagg aatttgtaat gagaagctaa aaactttaag gaattttaag gaactcaaaa      240
caaaaactca ttaaatgtaa ttaaagttaa ttctacaaat aaagcctctt aatacatttc      300
tataatagtc acttaagact taaattcaaa cactagcaaa ccacaaaatc agactgtntg      360
actgacatcc aaaagataaa tataaatcaa aatccgaccc cagcattagc caaggggtag      420
gtgttcctct tgaggaaggc aggaattcct cttctgccac ctggttg      467

```

```

<210> 457
<211> 183
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(183)
<223> n = A,T,C or G

```

```

<400> 457
ccaaatttttn tacttttaaac actgaaaaca gaggaagtta ataaaaattt taacctataa      60
agtcccctgg ttgttagtca ttaacagcag attgtcagat aagactggta aaatgatggc      120
tgctaagcat ttgatgatcc aggcgcagga tgatcaaact gcagcagatc atgcacgtga      180
cag      183

```

```

<210> 458
<211> 445
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(445)
<223> n = A,T,C or G

```

```

<400> 458
gaaaaatata aagccaaaaa ttggataaaa tagcactgaa aaaatgagga aattattggt      60
aaccaatttta ttttaaaagc ccatcaattt aattttctggt ggtgcagaag ttagaaggta      120
aagcttgaga agatgagggg gtttacgtag accagaacca atttagaaga atacttgaag      180
ctagaagggg aagttgggta aaaatcacat caaaaagcta ctaaaaggac tgggtgtaatt      240
taaaaaaaac taaggcagaa ggtttttgga agagttagaa gaatttggaa ggccttaaat      300
atagtagctt agtttgaaaa atgngaagga ctttcgtaac ggaagtaatt caagatcaag      360
agtaattacc ancttaatgt ttttgcntt ggactntgag ttaagattat tttttaaatc      420
ctgaggacta ncattaatgg gacag      445

```

```

<210> 459
<211> 426
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(426)
<223> n = A,T,C or G

```

<400> 459
 cctatgatan cttctctagc tatcatactc caatcagcaa aaaatgagaa aatgttgaga 60
 aatagaagat aattcctcat ttaaggccac cttctagaat ttgtgcttaa gattctgctt 120
 tcttctcatg ggccagcact tcggcaactg gcaaaaatta ggtgtacagg gatctaggta 180
 atactgttta tttgagcaat aatatattgt gctaacgttc aggcataccta ttactgagaa 240
 ataagggaaa atgagtgtaa agtacaacta agagtctcgg cgacagggaa aaataccatc 300
 agttaaatat ccatagtcct agagcattta tgtaaaactg caatntgaat cctgcaatac 360
 atnttggtt tttccctcag tgataccatg tgagggaagn ngctctgtca aggcgggccc 420
 gataga 426

<210> 460
 <211> 348
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)... (348)
 <223> n = A,T,C or G

<400> 460
 ccaaatttta aaatgttatt tttcatatca tttataacct tgtcacaatc cacttaaaga 60
 agtttggtta tatttctactg aaaattttct tccagagtag gtttttttct gtgggttggg 120
 gggtaacttt actacaatta gtaagtntgg tgcagaattt catgcaaag aggagtgcag 180
 cagngtgata atttaaacad atntaaacaa aaacaaaaaa aatgaatgca caaacttgct 240
 gctgcttaga tctactgcagc ttctaggacc cggtttcttt tactgatnta aaancaaaac 300
 aaaaaaanta annacnttgt gcttgaaatg aancctgttt ttttntna 348

<210> 461
 <211> 378
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)... (378)
 <223> n = A,T,C or G

<400> 461
 ccactaagac agaacggaat ctagtagaag tgcaccaatg cttcagtcct tctactcag 60
 catggtgagc agtgggtcaat ctgtgccctg tggatgatg ggcagataat tctggcatgt 120
 gtaaataata ataaataatt cacttggtgc aggcagtatg tctatgaatt aaaacctagt 180
 gtgtacacag tgcctacatg tgttacagcc ccacagtagg aatctacacc aaaatattta 240
 ttagaaggaa tttggtccgt actacatcac gctttccgga gggtaaaaaa taaagtccat 300
 ctatagacat ttcaccacag acccagagac tgagtctggc taaaacctgc aaaatgtcta 360
 taacaaaagn ggatggct 378

<210> 462
 <211> 197
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature

<222> (1) ... (197)

<223> n = A,T,C or G

<400> 462

gcgagggtcca	cactattaaa	agctgttggg	taattgaagg	tgatataaaa	tgactgtcnt	60
catttggagt	gngcagcaca	nttacttcat	gttgctcang	tttanaacaa	tntccctgn	120
aagttctcac	acagatnggn	agaaatcata	cctanttntg	gtnaatcact	atggcagccg	180
tngaagaatn	taagaga					197

<210> 463

<211> 279

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (279)

<223> n = A,T,C or G

<400> 463

cataagtgat	gangaggnaa	aatcantnaa	taagcctaca	acntagaata	cattaaaaact	60
tgcacatata	catgttcaca	gcatgtatac	aatgataatc	cctacggttt	aaccaagtta	120
tggttccctt	ctacagcaga	cacaaaacca	aggtgaacta	ggtnggcaga	tgtanaggga	180
ataccaaaaa	aagggtaatn	ngntcactga	ttctgaagna	tntgactgan	catactgagc	240
ttctgnactt	tgggaatgca	tnnaggnaac	aatatcttg			279

<210> 464

<211> 552

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (552)

<223> n = A,T,C or G

<400> 464

gatgggttga	taggtgcagc	aaaccaccct	ggcgcatgtt	taccaatgta	acaaacctgc	60
acatcctgca	caggtactcc	aaaactaaaa	gtaaaaaat	ctaaaagaaa	aaagaaaaag	120
aattaaaccc	aaaatcactt	ccccatctgg	acttgattta	gatgaaaagc	ttctggactt	180
tgagctgatg	ctatagtggg	ttgaaaattt	tggggctctc	agaaggggat	gaggatatat	240
tgcagagag	agcaacatga	atcatngaga	gccagagtat	agagagnggt	gggtagactg	300
taggagagcc	ctcaatgatc	cgggctgtct	tgtattcgcg	ttgcacttac	ttgtataata	360
tggcagatgg	gatgtgatgt	cactttcaag	attangttat	aaatagacta	tggcttcaat	420
cagaggggtt	tcttctctgt	ctanctctct	tttgggtagn	ttcattctga	gagaaagcca	480
nacctcngcc	gcnacccacg	ctaaggggcg	anttccagcn	cactggcggc	cngttactag	540
tggatccgng	ct					552

<210> 465

<211> 444

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(444)

<223> n = A,T,C or G

<400> 465

ccactcttgg tagaaacctt gaaactttca ccttgctggg ctttagcaaa gtttcctttt	60
acagttctgt ttatgagctt cagctactga taaagcactt cctgaacttc tctattatca	120
tagngaccct ctgaataacc tgagtgactg gctcggcaat tcgctttata accattctta	180
ttcccaaagt tggagcacat aaacatttag atgtcttttc ctgtaaaata ttctagacat	240
ttacccaaac tctagttaa catatactca acttgactg tataatctcc tgcttttttg	300
agacagagaa gaaattcagg aggtgnccca tctccagagt ttctctgttg gaaagcagcn	360
atcaagaanc ctttaaaaaa ttggtgtnaa gctntgccnc ctgcagaaat gcntngcccc	420
acattattct tctgggnaa agna	444

<210> 466

<211> 381

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 466

cctactatgg gtgttaattt ttactctct ctacaagggt ttttctagt gtccaaagag	60
ctgttctct ttggactaac agttaattt acaaggggat ttagagggt ctgtgggcaa	120
atttaaagtt gaactaagat tctatcttgg acaaccagct atcaccaggc tcggtagggt	180
tgctgcctct acctataaat cttcccacta ttttgctaca tagacgggtg tgctcttta	240
gctgttctta ggtagctcgt ctggnctcgg gggctcttagc tttggtctc cttgcaaagt	300
tatttctagt taattcatta tgcannaggt ataggggnta gtccttgcta tattatgctt	360
ggttataatt tttcatcttt c	381

<210> 467

<211> 95

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(95)

<223> n = A,T,C or G

<400> 467

cctatanatt ntggnttgta tactgggtcc tgaaaaccct cttgngctc tgtttttaag	60
gagctgaanc caangancgc caataataat acttt	95

<210> 468

<211> 224

<212> DNA

<213> Homo sapien

<400> 468

cagtgggtct ctgatgcctt gcctgcagca gaaggaggga gcagagatca agaggaagga	60
aaaaatcata tgtacttatt tgaaggtaaa gattattcta aagagcccag taaggaagac	120
agaaaatcat ttgaacaact ggtaaacctt cagaaaaccc ttttgagaa agctagtcaa	180

gagggccgat cactccgaaa taaaggcagt gttctcatcc cagg

224

<210> 469
 <211> 416
 <212> DNA
 <213> Homo sapien

<400> 469
 ctgagttcta gttcaaaagc tttatcctta acttcgtcat gtactatgta aattctagaa 60
 tagaaaaggg aaaggtaaga ttttggtaac ctccaaacat tgaagtagtt cacagaccca 120
 aagtcagtac aaattagaat gtccatccat aataaaaagta tctataaaat tacacagaca 180
 cattctacat agtatttaac attagagaag acaaattaca cagggactga aataaaatga 240
 aacatctact ctcccgacaa atgttggaata tacctaatac acccaagttc agttttatatt 300
 tgcacattgc ttttagagata taacttggct gggcacagtg gctcacacct gtaatcccaa 360
 cactttggga gaccaaggcg gatggatcac ttgaggtcag ttcgagacta gcctgg 416

<210> 470
 <211> 376
 <212> DNA
 <213> Homo sapien

<400> 470
 caccttttaa ctgtatcaca aagtctgttg ctgtgggttac agcctttggt tccagtgatg 60
 ttttgtccat gctttccccc aacccttaac aatggttact caaaagaatg aaataatgag 120
 tcattcattc gggaatatgt taaaatatcc ctctttatca ttacatttca ctgcttagaa 180
 actaggctgt aattcaaggc aacagttaag tctgagaact gttaaaaaaa tctttgattt 240
 tttttcattt ttaagaaaaa cctgcctatt taattgttca gacttgtaag aggttcttca 300
 attacatcct ttttggttaa tgtattattt ctggaacaag tagataaaat tctacgcagt 360
 aagcataata aaaatc 376

<210> 471
 <211> 357
 <212> DNA
 <213> Homo sapien

<400> 471
 ggcttcgtat aatggttctt ttgtcacccc tgatecgacga tttegtctacc cgtacaactc 60
 tgacaaggga acgaaatgct tctgtgtatt cacctagtgg tctgtgaac agaagaacaa 120
 caactccacc ggatagtggg gtactgtttg aagggttagg catttcaaca agacctagag 180
 atgttgaaat tcttcagttt atgagacaga ttgcagtaag gaggccaaact acggcagatg 240
 aaagatcttt gcggaaaatt caagaacaag atattattaa ttttagacga actctttacc 300
 gtgctgggtgc tcgagttaga aatattgaag atgggtggccg ctacagggat atttcag 357

<210> 472
 <211> 557
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (557)
 <223> n = A,T,C or G

<400> 472
 cngagatgac atttacaatc tcttgaaaang cagcagatgg cactctggtg cttcctatga 60

```

agcaacatgc ttgaaatcaa gggccaacaa ttgttgtagg aaagcaaaat atacctctaa 120
cacctacgtt taccaaaaaa gctgacatct caaactctga gttgttgaga ctcaaatttc 180
tcatcccaa agaagcctat tacggtagtg tgntggatgc tttttgtatc tctgataggc 240
aggcactata atgggggggaa atacttctga ataaaaacat tggctgtctt gcaactgtgc 300
atataatgtc tattcaaggg ggcagtgtgc ctagcatgat cctgaaatgt tgagataaaa 360
ggaagtggc attaaagcac tatttgtctt atatgaaaag agtgactcta tcttccagta 420
aacaagantt cctgcaatga aaaagaaatt ttttccttca ttatctataa actatacaaa 480
ataaccttcc tttttaacct aagactcaaa cattnatatt tgattttatt ctatttgata 540
ccaattggta tgtccag 557

```

```

<210> 473
<211> 264
<212> DNA
<213> Homo sapien

```

```

<400> 473
cctccatcaa cagaaaggat aaagaccctc tcgggtctcc tcattaattc tgaactggaa 60
aagccccaga aagtcaggaa agacaaggaa ggaacacctc cacttacaaa agaagataag 120
acagttgtca gacaaagccc tcgaaggatt aagccagtta ggattattcc ttcttcaaaa 180
aggacagatg caaccattgc taagcaactc ttacagaggg caaaaaaggg ggctcaaaag 240
aaaattgaaa aagaagcagc tcag 264

```

```

<210> 474
<211> 165
<212> DNA
<213> Homo sapien

```

```

<400> 474
aattcagctt ccagaggccc ttattagtcc ttgttgacag aaacatagat ttggcaactc 60
ctttacatca tacttggaaca tatcaagcat tgggtgcacga tgtactggat ttccatttaa 120
acagggttaa tttggaagaa ttttcaggag tggaaaactc tccag 165

```

```

<210> 475
<211> 417
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(417)
<223> n = A,T,C or G

```

```

<400> 475
aagttctctt cttgttttaa acacattcct gataacttct aaagatgacc aaaataaaac 60
agaatatcta cagagatcat tttctgaatt ttttgtacat ccaaggataa caacataaaa 120
aaaataaaac tggacagcat tccacatcca agtgcacaga accatttttg caagattaaa 180
taatgtaaac attgggaaca gccaaatcag cgaagaatgc caacacctca aaacacctgg 240
tgttgccgct tcattaagtg gttcaaaatc cagatctata attgcgcaat attcaccgta 300
tataaaaaga aatggatatt aattttgaca aatagctgca actgagactt ctttttattt 360
ctttatatgn gnatatagtg aatttttatt atttttaaaa ttttatttat tttttta 417

```

```

<210> 476
<211> 321
<212> DNA
<213> Homo sapien

```

<220>
 <221> misc_feature
 <222> (1)...(321)
 <223> n = A,T,C or G

<400> 476
 catttaataa caaaaacaac ctgtacggaa aaccnaagg caaccacata gcatatgtaa 60
 aatgtgcaaa tacactttta aatgcangtt attctatagc anttgcaaga tagaatttca 120
 ctgtaattag ggaatctagc tcacctaac ttaatagnct tttgcatgtn tagacaatgc 180
 aattctacaa ggnacnactc agcggtgatg cttaaagtatg aaacacatcc tcagattatt 240
 catccgaaaa tattaaaata gntcatgtt ttattattct ttaatgagtc ntgagctcat 300
 ttctaaagct tcataaagca t 321

<210> 477
 <211> 546
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(546)
 <223> n = A,T,C or G

<400> 477
 gctgtgggtta tattgtaaat gaagcatcta acatgtgcac aacttgcaac aaaaactcct 60
 tggactttta atctgtcttt ctacagttcc atgtgctgat tgatctgact gatcacacag 120
 gcacctttca ttctgtagt ctacaggaa gtgttgctga ggagactttg ggctgcacgg 180
 tacatgagtt tcttgcaatg acaaatgaac agaaaacagc attaaagtgg caattcctct 240
 tggaaaagaag caaaatttat ttaaaattcg ttctatcaca cagagcaagg agtggattga 300
 aaattagtgat actctcgtgc aagcttgcat atcctactga ggcaagcaga aacttgcctg 360
 gacaaaagaca tgttttaaac ggtctatcat tttgaactct ggaaaagtat aagagtttta 420
 actcccttta aaatggaata ttaatttgaa aattatgggg aaaattgcat tttgtttaca 480
 tgtggtgaac atgtttctag aaattggtat ggcgggaagg gggctgggtg agtctgaagg 540
 acctcn 546

<210> 478
 <211> 100
 <212> DNA
 <213> Homo sapien

<400> 478
 aagaaaagtg gtaaaatcaa gtcttcttac aagagggagt gtataaacct tggttgtgat 60
 gttgactttg attttgctgg acctgcaatc catggttcag 100

<210> 479
 <211> 508
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(508)
 <223> n = A,T,C or G

<400> 479
 gnnttccaaa ttcttctaac ttttccaaaa gccttctgcc ttagtTTTTT ttaaattaca 60
 ccagtccttt tagtagcttt ttgatgtgat ttttaaccaa cttcccttc tagcttcaag 120
 tattcttcta aattggctct ggtctacgta aacaccctca tcttctcaag ctttaccttc 180
 taacttctgc accaccagaa attaaattga tgggctttta aaataaattg gttaccaata 240
 atttcctcat ttttccagtg ctattttatc caatttttgg ctttatattt ttctatcttc 300
 tatacttctc caatacttgt cttagcttgt ttttcatttt ctatctgaaa ctcttgacaa 360
 tatcttctaa tttccctatc ttctctatc ttttcttcgc cttcccgtae ttctgcttcc 420
 agntttccac ttcaaacctc tatcttctcc aaattgttca tcctaccact cccaataatc 480
 tttccatttt cgtgtagcac ctggncag 508

<210> 480
 <211> 81
 <212> DNA
 <213> Homo sapien

<400> 480
 ggtgcccttt tcctaact cacaacaaaa ctaactaata ctaacatctc agacgctcag 60
 gaaatagata aggaaaatga c 81

<210> 481
 <211> 306
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(306)
 <223> n = A,T,C or G

<400> 481
 tcgccttcgg ccgccgggca ggtaggggn acaagacgct acttccccta tcatagaaga 60
 gcttatcacc ttcatgata acgccctcat agtcattttc cttatctgct tcctagtctt 120
 gtatgccctt ttctaacac tcacaacaaa actaactaat actaacatct cagacgctca 180
 gggaaatagaa accgtctgaa ctatcctgcc cgccatcatc ctagtctca tcgccctccc 240
 atccctacgc atcctttaca taacagacga ggtcaacgat ccttccccta ccatcaaate 300
 aattgg 306

<210> 482
 <211> 582
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(582)
 <223> n = A,T,C or G

<400> 482
 ggggggaaca gtcattatac attatttaga ctcatctctt cttccagtgc ccttatgatt 60
 atttcttacc ttaccattg atcttaaaact gngcaggcta aaaagaggaa ccagaactcc 120
 cttaagcact tttaagacta tttaaaaaat aaagntttgt tggcattgaa gagtaagctg 180
 cttaagggac tgaatgaaaa gatagtaccc tttgtggctg tatgaagaga gaaactgaat 240
 ttctatccaa gagaccttaa tntagcctat tagggaatta tcttcccaa aagtacaagt 300
 aattttgcac tgcaggagaa ggataagtag atttgattta catcacattt tatacacacc 360

```

tttcaagang gagaaatctg cttcataaat agnaggaatc tatgcttaaa ctnaacattt      420
aatggtgacn tcttacaaca gccttgaaaa nnattggaan tcngacntga ngngggaaac      480
tggaanaaag aatatctttc tcttctgcat cctttnatcc tcaaacttag catggattca      540
cacgctgagg aaangttngg tnacnaccng aacattttaga ta                          582

```

```

<210> 483
<211> 275
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (275)
<223> n = A,T,C or G

```

```

<400> 483
gcctcactaa aataacagat ttcagtatag ccaagttcat cagaaagacc caaatggaat      60
gatttacaaa atagaacact ttaaaccagg tcagtcctat cttttttag tagaaggcta      120
tcagtcataa cacaatttcg cgtacacctc tgctcattat ggaattacac ttaaaacgaa      180
tctcaagagg gtgaccattg ttgtttcaga taccatccct aaggagagtg gttaacagga      240
agattgccag ngttactgat ggaaagaagc gcttg                                275

```

```

<210> 484
<211> 434
<212> DNA
<213> Homo sapien

```

```

<400> 484
catatttcca caggccaatt tctttctggt tttctgctaa gctatttcag catttttagct      60
tttcctcttt gctttgttta ctcatgattg ccagatggct acgttacctc taagcatcag      120
atcctcacaa attaatggtt aaatgtaagg gagggatttt actctcttgc attaaaaaaa      180
agctttattg agatataatt tactgtaaca ttgactcatt taaagtatgc tagtcaatag      240
accaaactct gaataaactc ccattcacaa ttgctacaaa gggaataaaa tagctgggaa      300
tatagctaac aaggggaagt aagggcctct tcaaggagaa ctacaaacca ctgctcaaga      360
aataagagag gatacaaaaca aatggaaaaa cattccatgc tcatgaatag gaagaatcaa      420
tatcgtgaaa atgg                                434

```

```

<210> 485
<211> 291
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (291)
<223> n = A,T,C or G

```

```

<400> 485
ncaccactgc agccctacat acagttgaaa aaaaattcca ttctgttaac atttgtttta      60
taagttttca cgcaatacac aaaaaacccc tctgcacttc ttgtaaagaa caaaaaagat      120
acacaacagt taagcgtaaa gatcacaggc aatagcattc aaacatggat gtgggtagag      180
aaaggagtac ctggcatgag tacctgctta gtttgactga atccttgatt ttttaatttg      240
cttttcatgg gccgctcaca acaccaacgc tgtgtgaggt atggtagtca g                          291

```

```

<210> 486

```

<211> 274
 <212> DNA
 <213> Homo sapien

<400> 486
 ctgtaatat gtagttgctc cagaatgtca agggcagctt acggagatgt cactggagca 60
 gcacgctcag agacagtga ctagcatttg aatacacaag tccaagtcta ctgtgttgct 120
 aggggtgcag aacccgtttc tttgtatgag agaggtcaaa gggttgggtt cctgggagaa 180
 attagttttg cattaaagta ggagtagtgc atgttttctt ctgttatccc cctgattgtt 240
 ctgtaactag ttgctctcat ttttaatttca ctgg 274

<210> 487
 <211> 184
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(184)
 <223> n = A,T,C or G

<400> 487
 tggcaccaag attctcagct cacgggtacca gcattctgatt gtcggactac ctgctgcttt 60
 ccctgatatt tatacatgat attcgnaaaa tgtaaagaag ctattattca tacagacatc 120
 tagagaagga gngaagnttt taaaaaaaata aaaaaatact tatttcaagc tttagctgtg 180
 ttct 184

<210> 488
 <211> 393
 <212> DNA
 <213> Homo sapien

<400> 488
 ctgcattttt attgcgatct gcagatgaac tggaaaatct catttttaca cagaactggg 60
 acagacgacc accatattca ctgaggtcta aatttgcagt ttccactaat gacattttga 120
 tttcccaaca gagatacttc tgggtcttact gcacagtctt ttaagagaaa tacttccatt 180
 atgccacatt gtccttgatc cgtaagtgat gtgttaagggt gcttcaaagg aactctgacc 240
 tctgaagtac ttgagctact ttagtatgtc cagcctattg ctttttggtt tagtgtgtca 300
 ccataaatat caggggcata aaaggctatc tattcttaat tcaaggataa aacagaagaa 360
 gcttgtggta taaaacaata gttcaagatc cag 393

<210> 489
 <211> 607
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(607)
 <223> n = A,T,C or G

<400> 489
 gtgcttatgt acttaagggg aactactcta actgggtgaa gaggatangt aagcatccat 60
 gtccttaca aggatattgaa ctcatccttt tttatggctg catagtattc catgggtgat 120
 atatgccaca ttttcttaat ccagttctatc atcgatggat atttgggttg gttccaagtc 180

```

tttgcatttg tgaatagtgt cgcaatgaac atacatgtgc atgtgtcttt atagcagcat      240
gatttataat cctttgggta tatacccagn aatgggatag ctgggtcaaa tggatatttct      300
agttctagat ccttgtggaa ttgccacact gtcttccaca atgggtgaac tagtttacag      360
tcccaccaac agtgtaaaaag tggtcctatt tctccacatc atctccagca cctgttggtt      420
cctgactttt taatgattgn cattccaact ggtgtgagat ggtatatcac cgtgggtttg      480
atgtgcattt ccctgatggc cagtgatgat gaacnttttt tcatgtggtt tttggctgca      540
taaattggcct gccttttnta cttctataaa atttttcann tcttattatt attcctgggg      600
gnttaag                                           607

```

```

<210> 490
<211> 179
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(179)
<223> n = A,T,C or G

```

```

<400> 490
cttctaggaa tactagtata tcgctcacac ctcataatcct cctactatg cctagaagga      60
ataatactat cactgntcat tatagctact cccataaccc tnaacaccca ctccctctta      120
gccaatattg ngcctattgc catactagtc tttgccgect gcgaagcanc ggtaggacc      179

```

```

<210> 491
<211> 399
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(399)
<223> n = A,T,C or G

```

```

<400> 491
cctctacctg taatcacatt aatttttcta aagacagggg nggtgttttg aagataaatg      60
tcattagtct atgataatag catcatagga caattagcca ttttagactt gaccatattt      120
tctcttttta gcatatagcc atcttgatat ttagngggga gactactcca atggagcaac      180
agtttcattt tacatgattg gatttagaaa ttacaaaatt ttaaactcat aagaattcta      240
aataatttga aaatggaaac atttgaccca cagtctagca gcataaatac atttataaaa      300
tacttcattg ttgatcttag gtcattgatt taaaacagaa tttggtgact atgggcaggt      360
ggaggggggcc ngtgaggaag gtataaaaaga gaaatcttt                                           399

```

```

<210> 492
<211> 482
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(482)
<223> n = A,T,C or G

```

```

<400> 492
ctccacctta ctaccagaca gccttagcca aaccatttnc ccaaataaag tataggcgat      60

```



```

agaaattgaa acctggcgca atagatatag taccgcaagg gaaagatgaa aaattataac      120
caagcataat atagcaagga ctaaccccta taccttctgc ataatgaatt aactagaaat      180
aactttgcaa ggggagccaa agctaagacc cccgaaacca gacgagctac ctaagaacag      240
ctaaaagagc acacccgtct atgtagcaaa atagtgggaa gatttatagg tagaggcgac      300
aaacctaccg agcctggtga tagctggttg tccaagatag aatcttagtt caactttaaa      360
tttggccaca gaaccctcta aatccccttg taaatttaac tgttagtcca aagaggaaca      420
gctctttgga cactaggaaa aaaccttgta gagagagtaa aaaatttaac acccatagta      480
gg                                                    482

```

```

<210> 493
<211> 207
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(207)
<223> n = A,T,C or G

```

```

<400> 493
cataaatatt atactagcat ttaccatctc acttngngga atgctagtat atcgctcaca      60
cctcatatcc tccctactat gcctagaagg aataatacta tcactgttca ttatagctac      120
tctcataacc ctcaacaccc actccctctt agccaatatt gtgcctattg ccatactagt      180
ctttgccgcc tgcgaagcag cggtagg                                                    207

```

```

<210> 494
<211> 283
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(283)
<223> n = A,T,C or G

```

```

<400> 494
ccaattgatt tgatggtaag ggagggatcg ttgacctngt ctgttatgta aaggatgcgt      60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct      120
atctcttgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg      180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaagggtg      240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac cta                                                    283

```

```

<210> 495
<211> 590
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(590)
<223> n = A,T,C or G

```

```

<400> 495
tatgtatata attttcttag ttactagcat agagaaatta ctgatttaaa aaaacatttc      60
aaattctagc atgttgtagg attctattgc cttttctaaa aagtacatct tgcttatccg      120

```

```

atttctaaca aaactatttta atttgaagaa gggagaatga atttggataa aaagcaaaaa 180
tttaaaggta ctcaaatttta ggcaaaccat taaagcaatc ttagttttaca gttaattggg 240
tagaatggtc aacacttttct tcaggttagt tcatggagtg gatatgcatt gatagaacaa 300
cttagagatg cttttacagt tgagaaagct cattatatatt gttatcttta agaatcagct 360
tattttatttc atatgtttgt tctttaagaa gaccaaagag ccctgcaaat gaatgttgat 420
ttgttttttt gtttgtttaa tatttttcta gagataagat ctcaactttgt tatgttgccc 480
aggctgggtc caaactctca acttgaagtg atctgccac ctacagcctcc caaagtgggtg 540
ggattacagg catgagccac cgcacctgga cctgcccggg cggncgctcg 590

```

```

<210> 496
<211> 307
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(307)
<223> n = A,T,C or G

```

```

<400> 496
ggagattagt atagagaggn anacnttttt tcnggatatt tggtcacatg gataagtggc 60
gctggcttgc catgattgtg aggggtagga gccaggtagt tagtattagg aggggggng 120
ttaggggggtc tgaggagaag gttggggaac agctnaatag gttgttngnt gatttgnta 180
aaaaacanta gggggatgat nctaataatt antgctgtgg gtgggtgtgn tgattcaa 240
tatngctttt ttcggagann catgtcangt ggtagtaaat ataattgttg ggaccattan 300
ttcttan 307

```

```

<210> 497
<211> 216
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(216)
<223> n = A,T,C or G

```

```

<400> 497
cattttcctc ttggtttctt cagttaagtc aaanngncac gttcctcttt ccccatatat 60
tcatatatatt ttgctcgta gtgtatttct tgagctgttt tcatgttgtt tatttcctgt 120
ctnggaaatg gtgttttttt ttgttgttgn tggttttttt ttttttttt aaactnggna 180
ccncnaantt gaaaaaatgn ttntttttcc ctnaca 216

```

```

<210> 498
<211> 375
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(375)
<223> n = A,T,C or G

```

```

<400> 498
gaatttcctg gcaccttttc tcgctagaga agattnnngt tgactggggt gcctataagc 60

```

catatagata caaactttta tctctaatac caagtcttag agggatatat taatagatct	120
aataaattta ttcttagact tattgtttca tgggntagtg agtctttgct actggagaca	180
atacagactt gtcagttttt ttaaaaaaaaa aaaatttgcc aagctancac attaaaaana	240
tntcctaagg cntcatttt atgaggatga ttataaacnt ttntgngata aatatcacca	300
taataaactg ttaagtacaa ctgcnggccn cccttanagn gaattcctnc agttanaaat	360
ttattttttt gccaa	375

<210> 499

<211> 215

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(215)

<223> n = A,T,C or G

<400> 499

ccacnaaagc agaagcttaa agcatagtag taaagaggnn aaaaagaagg acgaaaataa	60
atcagatgac aaggatggta aagaagttga cagtagtcat gaaaaggcca gaggtaatag	120
ttcactcatg gaaaagaaat taagtagaag gttgtgcgaa aatcggagag gaagcttgct	180
acaaaaaaaa aaaaaaaaaa aaaaaaaaaat gtttt	215

<210> 500

<211> 489

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(489)

<223> n = A,T,C or G

<400> 500

ccactacgat aagcaggtag ctgggttttg tagtgagntt gtccttaag ttacaggaac	60
tctccttata atagacactt cattttccta gtccatccct catgaaaaat gactgaccac	120
tgctgggcag caggagggat gatgaccaac taattcccaa accccagtct cattggtacc	180
agccttgggg aaccacctac acttgagcca caattggttt tgaagtgcac ttacaaggnt	240
tgtctacttt cagttcttta ctttttacat gctgacacat acatacactg cctaaataga	300
tctctttcag aaacaatcct cagataacgc atagcaaaat ggagatggag acatgatttc	360
tcacgcaaga gcttctctaa ttatacctta gaaatgttct cttttttatc atcaaactctg	420
ctcaagaagg gctttttata gtagaataat atcagtggat gaaaacagct taacatttta	480
ccatgctta	489

<210> 501

<211> 286

<212> DNA

<213> Homo sapien

<400> 501

aaaaacactc aaacacagcc ttggagggag gagtcagttt taaaagactc ttataaaagt	60
aataactgct tagctctgaa gaatcggagg ctaaaatcat ctcttcaagt cccagggaa	120
tcccaaagaa ctccagggga aggtgggatg ggccagagag ctctggaagc ttccaggtct	180
gttgcaagcc tcacctggtc cacagtaggc tcttcagggt ctgtcaggaa cccaggagcc	240
tcccctagca cacagtaggc tcacaaaaag ggagcactgc tgctgg	286

<210> 502
 <211> 168
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(168)
 <223> n = A,T,C or G

<400> 502
 cctatgattg tgggggcaat gaatgaagcg aacagagntt cgttcatttt ggttctcaga 60
 gtttggtata atttttttatt tttatgggct ttggtagagg aggtaagtgg tagtttgtgt 120
 ttaatatatt tagttgggtg atgaggaata gtgtaaggag tatggggg 168

<210> 503
 <211> 173
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(173)
 <223> n = A,T,C or G

<400> 503
 cctttataat aaattaggca aaagggttcag tgcnnnggcta tantggacaa catgaaactc 60
 cataaaaatg actggatagg gggactgctt gagacttttc ttttgggcat tactaacaga 120
 attcaaagaa attccaacca cgcttatattt tccaaattct actgaaatga gag 173

<210> 504
 <211> 310
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(310)
 <223> n = A,T,C or G

<400> 504
 tagtattcta tttaaaaaatt aagttttggg gtctgtaaaa tatacaggac aatgactttt 60
 ttaaaatgta agttaataacc tcctcctcac ttgtcttaat tgaacttagg tgtttattct 120
 taaaggngga ccttgatgaa aatgttgaga tgggaagtgt tattaggcaa aacttggtat 180
 agattttctca tataactctt aattgaccct tagaatttta acaaccgcgc ctggcccaat 240
 agactgtttt ttagagtant tttaggctct cancaaaatt gaggggaaaa tacagggtgt 300
 tccccattaaa 310

<210> 505
 <211> 530
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(530)
 <223> n = A,T,C or G

<400> 505
 cctcagggaa cttacaatta tggcaaaagg ggaaggggaa gcaagcacct tcttcacaag 60
 gcatcaggag agagagagaa agagagtagg ggaaactacc ccttttaaac catcatatcc 120
 tgtgagaact ccctcagtat tagaagagca tgagggaaac cgctccata atccaatcac 180
 ctcccaccag gaccatccct caatacatgg gggttacaat tcaagatgag gttcgggtgg 240
 ggatacagat ttaaaccata tcagaatggg taatgatatt gttgtatatt accaactata 300
 atcttcttag tgttatagta caataatgta aaaaattgag taaatttggt ttctatatta 360
 ttctgttttt ggaaaacatg tatatagtca gggctgtttg tctcaagaaa atatggtaaa 420
 ctctgctgtt ttggctactg gtgcctagaa tttggggatg tacattgggt ttgattcaca 480
 tgcacatttc cttctagttc acagtaacta tttctaacta tttcccnata 530

<210> 506
 <211> 352
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(352)
 <223> n = A,T,C or G

<400> 506
 cttgaacgct ttcttaattg gtggctgctt ttaggcggtg ctatgggtgn taaatttttt 60
 actctctcta caagggtttt tcttagtgct caaagagctg ttctcttttg gactaacagt 120
 taaatttaca aggggattta gagggttctg tgggcaaatt taaagttgaa ctaanattct 180
 atcttggaac accagctatc accaggtctg gtagggttgt cgctctacc tataaatctt 240
 cccactatct tgctacatag acgggtgtgc tcttttagct gttcttaggt agctcgtctg 300
 gtttcggggg tcttagcttt ggctctcctt gcaaanntat ttctagttaa tt 352

<210> 507
 <211> 370
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(370)
 <223> n = A,T,C or G

<400> 507
 cctaactaga tcttatcaga atagggggga agggngtcgg ttcattcctta ttgagtgtta 60
 atgaccctgt aagatgtaat ttcttttatt tcattctgtt acctagaaaa tctatcacag 120
 ccttgtagta ttgattgctc aatctataaa gagctcagtt tacagcatga ctgtagtaaa 180
 caggngtatt ttaatgagtg actcttcaac acctcagagt ttcactaaat tccaacccat 240
 cagcccagta gtctaacatt aagggtctta ggaaatgaga acttatcacc tttccttatt 300
 atgaaaagggt aacctccagg taacccaaaa tagaacttcc tctgtgttcg ttttttatag 360
 aaattactgg 370

<210> 508
 <211> 129
 <212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(129)

<223> n = A,T,C or G

<400> 508

ctgttaaaaag aacaaactta gcaatatata acagttnggt aacaggattt ttgactattc	60
actttggggag ttattttttaa aaatccactt ttttactgag tcttactaca taccaggcac	120
tgtacttgg	129

<210> 509

<211> 422

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(422)

<223> n = A,T,C or G

<400> 509

ntgggaagtc gtgacatcca tgggaaccca gcgctgtgat gctgggtgttt gngttctccg	60
cgagaagtga ccattgttgg agcaccatcc agagctagtg accantncag tggacagtta	120
gtgggagaat caaaaatcct ttccagaatg tctgtttctc actacntgca ccgggngatt	180
acaggcacca gtgcagngat gattgtactt atttgacaca tactccccgt cntcctggnt	240
nttgttcctg anaanggtgg gtaaatattc caggaaaaan aatgcacatt gaatggatgt	300
gagagaccac attgcctctc ccactgcttt ggggagcact ttctgtcat ttctaactta	360
ccacntgctt ggtgtactat atgtatgttg tgcctcatat gttgcaaaga actaangtga	420
gt	422

<210> 510

<211> 238

<212> DNA

<213> Homo sapien

<400> 510

ccacctatga attggtgggtt tacctactca atggatagca gcacgaggac tgctgtactg	60
cacaaaaaga agaccaaaaag attacagtgg accatgggat acagaagcca gcatggcaga	120
cagaagaaaa atagtttggg aacatgtaac tatcctaagt ggaagttttg ttgtaggaat	180
tatagtaatc acaccacatt acttggcctt tcggtaatgt gaaaaaaaaa aaaaatcc	238

<210> 511

<211> 254

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(254)

<223> n = A,T,C or G

<400> 511

ccnattgatt tgatggtaag ggagggatcg ttngggctcg tctgttatgt aaaggatgcg	60
---	----

tacggatggg	agggcgatga	ggactaggat	gatggcgggc	aggatagttc	agacggtttc	120
tatttcctga	gcgtctgaga	tgtagtatt	agttagtttt	gttgtaagng	ttaggaaaag	180
ggcatacagg	actaggaagc	acgataagga	aaatgactat	gagggcgnga	tcatgaaagg	240
tgataagctc	ttct					254

<210> 512
 <211> 269
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(269)
 <223> n = A,T,C or G

<400> 512						
cctacctgta	aactacagta	ctttatatat	ctatgggntt	aataaaaaana	aaatccacaa	60
atcttaaaaa	ggaacttttaa	atgcagggct	atattgaatt	ggnaaactgc	aacacaaaact	120
ggcgcaacat	aggtaaatga	ataccaatct	cactctatgt	gatgcaagca	tgctactttc	180
ccactaattt	aaattacttt	caaccactat	gagccagaat	gcatgcctga	accttaaaact	240
gcacttttaa	aagtaacatc	ttggcctaa				269

<210> 513
 <211> 266
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(266)
 <223> n = A,T,C or G

<400> 513						
ggaggggggt	tgtagggggg	tcggaggaga	aggntgggga	acagctaaat	aggttgttgt	60
tgatttggtt	aaaaaatant	aggggggatga	tgctaataat	taggctgtgg	gtggttgtgt	120
tgattcaa	tatgtgnttt	ttggagagnc	atgncantgg	tagtaatata	attgttgaga	180
cgattagttt	tagcattgga	gtaggtttag	gttatgnacc	gtactctagg	ccatatgtgt	240
tgganattga	nactagtagg	gctagg				266

<210> 514
 <211> 271
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(271)
 <223> n = A,T,C or G

<400> 514						
acatgcaana	aatcgagaat	cttaaaaaac	annacgaanc	tgccctggaa	nncttactgg	60
nntangatat	ttatnttgcg	gctgagatac	ttgaacaact	tcggatcnga	antagacaan	120
aangggnant	tntatactgc	nncagagggt	acacagntca	ttgtattaga	gangaacana	180
tgggtctgg	gttcacacat	tgggggggaan	atgggcgtnn	acangagagg	nnganaaacn	240
anganagcct	ncctgggtng	cataanaaaa	a			271

<210> 515
 <211> 328
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(328)
 <223> n = A,T,C or G

<400> 515
 ccaatgaggg gcaaagtgag cgncnagaag angttttgac tgaaataaat caaacacaaa 60
 aatntaagtt cacagtgaca gtttaaacia aatccaaaca aactaacaac anaaacaccc 120
 cttgntttgc ctctagtggg aggtgggana acacaanctc gtcctaaaaa ttgactagta 180
 aaggggaaaa cccggtcatt tncctactct ttccangaaa tatctaatac aagaaagaac 240
 ttctnctcat tatacngaag gaatttngaa aaatgatgta tttttggaac acctaantga 300
 aatactggaa cctgggcaag ttcaccac 328

<210> 516
 <211> 220
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(220)
 <223> n = A,T,C or G

<400> 516
 ncctnagttg aaggacccca tgtacatata ggccagggga gcagtactag gntaactaga 60
 aggatctcat ccccatatgt gggctcattt caagtctatg gatgactacc ttcattgntg 120
 tgtgagagat gggttcaccc cttgaaaata tgggcacttc ancataanat agcnaaatct 180
 ttataatgat caatncatcc tacctccttt tacatgcatg 220

<210> 517
 <211> 296
 <212> DNA
 <213> Homo sapien

<400> 517
 tgcgatttct tccttggtgt ttgctttggt ctgtgttcaa tccagagagc ttaaattgtc 60
 attattttgg gaagaaaacc tgtatttttg ttagtttaca atattatgaa atttcacttc 120
 aggagaaact gctgggcttc ctgtggcttt gttttcttag tttcttttcc cgtgccgtgt 180
 attttttaat tgatttttct tcttttactt gaaaagaaag tgttttattt tcaaattctgg 240
 tccatattta cattctagtt cagagccaag ccttaaactg tacagaattt ccactg 296

<210> 518
 <211> 299
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(299)

<223> n = A,T,C or G

<400> 518

gaagatagaa	aaatataaag	ccaaaaattg	gataanatag	cactgaaaaa	atgaggaaat	60
tattggtaac	caattttattt	taaaagcccc	tcáattttaat	ttctgggtggt	gcagaagtta	120
gaaggtaaag	cttgagaaga	tgagggtggt	tacgtagacc	agaaccaatt	tagaagaata	180
cttgaagcta	gaaggggaag	ttggttaaaa	atcacatcaa	aaagctacta	aaaggactgg	240
tgtaatttaa	aaaaaactaa	ggcagaaggc	ttttggaaga	gttagaagaa	tttgggaagg	299

<210> 519

<211> 464

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(464)

<223> n = A,T,C or G

<400> 519

gctgcacatc	ggaggaaaaac	tcggtaaagc	agaatgaggt	tgatatgttg	aatgtatttg	60
attttgaaaa	ggctgggaat	tcagaaccaa	atgaattaaa	aatgaaagt	gaagtaacaa	120
ttcagcagga	acgtcaacaa	taccaaagg	ctttggatat	gttattgtcg	gcaccaaagg	180
atgagaacga	gatattccct	tcaccaactg	aatttttcat	gcctatttat	aatcaaagc	240
attcagaagg	ggttataatt	caacagggtga	atgatgaaac	aatcttgaa	acttcaactt	300
tggatgaaaa	tcatccaggt	atttcataca	gtttaacaga	tcgggaaact	tctgtgaatg	360
tcattgaagg	tgatagtgc	cctgaaaagg	ttgagatttc	aatggatta	tgtggtctta	420
acacatcacc	ctcccaatct	gttcagttct	ccagngtcaa	aggc		464

<210> 520

<211> 221

<212> DNA

<213> Homo sapien

<400> 520

ctgatatcta	cttattttaac	acaagtctct	aatacaatac	aatttttatta	attttattcc	60
acatgcccc	cattagatct	ctagactcat	tcatcctaca	tacctacttt	gtatcctttg	120
acctacatct	ccctacttcc	tcctccagtc	cccaccccc	acccactggg	gctaaccact	180
gtttcattcc	cttttttcatt	ctacatatgt	gagatcatgc	t		221

<210> 521

<211> 312

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(312)

<223> n = A,T,C or G

<400> 521

ctgatagctt	tctcttcgcc	tagattaata	tcttctnnct	tcccattcac	agccccacc	60
gacatcaaag	ctttgctgtt	ttatctgtca	aaaatgtctt	cacacttttc	attcttaaat	120
aaaagtgtg	agtaaggaca	ttttcacaa	aaatttttat	tttacaacaa	ttacaatgat	180
ttgaatccaa	aacaactttc	attattttaac	tgtaaagtaa	atatatattt	tatttagngt	240

gtcttagttc attttgtgct gctttaacag tgtatccttg tgatagttgt ggggtggggg 300
 aggggggaag ga 312

<210> 522
 <211> 336
 <212> DNA
 <213> Homo sapien

<400> 522
 ccttctttcc ccaactcaatt cttcctgccc tgttattaat taagatatct tcagcttgta 60
 gtcagaccca atcagaatca cagaaaaatc ctgcctaagg caaagaaata taagacaaga 120
 ctatgatatc aatgaatgtg ggtaagtaa tagatttcca gctaaattgg tctaaaaaag 180
 aatattaagt gtggacagac ctatttcaaa ggagcttaat tgatctcact tgttttagtt 240
 ctgatccagg gagatcacc ctctaattat ttctgaactt ggtaataaa agtttataag 300
 atttttatga agcagccact gtatgatatt tttaag 336

<210> 523
 <211> 172
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(172)
 <223> n = A,T,C or G

<400> 523
 ngacnggcnc ntggctatgt ntatagatag ggctttaacc actatctgng aagcangagn 60
 gacannattc ttgctctcac atnccacngg anacgtattt ctcttctctt acnagcgaag 120
 aaccatctnt ttctaaagcc cccattctat tgccttgct tttctctggc tt 172

<210> 524
 <211> 471
 <212> DNA
 <213> Homo sapien

<400> 524
 ccagacctgc agaaaaactt agcacagctc aatctgctgt tttgatggct acagggttta 60
 tttgggtcaag atactcactt gtaactattc caaaaaattg gagtctgttt gctgttaatt 120
 tctttgtggg ggcagcagga gcctctcagc tttttcgtat ttggagatat aaccaagaac 180
 taaaagctaa agcacacaaa taaaagagtt cctgatcacc tgaacaatct agatgtggac 240
 aaaaccattg ggacctagtt tattatttgg ttattgataa agcaaagcta actgtgtgtt 300
 tagaaggcac tgtaactggt agctagttct tgattcaata agaaaaatgc agcaaaacttt 360
 taataacagt ctctctacat gacttaagga acttatctat ggatattagt aacatttttc 420
 taccatttgt ccgtaataaa ccatacttgc tcaaaaaaaa aaaaaacctt c 471

<210> 525
 <211> 332
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(332)
 <223> n = A,T,C or G

<400> 525
 cccnctgta ttccagcctg ggtgacccca tctcanggaa gaaaagttac cagatgtcgn 60
 gggtaaaggt tggcttcaa gtggcctcat aagttgtctt gcattttaat tcaggaatt 120
 cattggacca ataggttaca ttttcgttcc ttttttgttt tggttcatct gtttaagcagt 180
 gggggcctaa ttactgctcc tttgtaaaaa cacattttcc caaagaacac tgaattaccg 240
 ttcaaactgg ttgttgatgg gtaataaggg ctgtttttgc tgcccaaaaa gggcttaaca 300
 atttaggcgg atagtttact taaaaaaaaa aa 332

<210> 526
 <211> 440
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(440)
 <223> n = A,T,C or G

<400> 526
 ccaggttacc tcccctaaca gatgtggtgt tctganggggt tggttaagtg cccgaggaaa 60
 ataggcctta actgttaaca tctacagaga agaaagcatg gtcacactgg caaggagtaa 120
 gaagggattg ggtaaaagaa aatgggagag aaaagggaaa aaagttttgg caagacaatt 180
 gttccctgct aagaagctgc agggtgaaa ctttcctttc ttctattttt gtttttaatg 240
 nctgtctctc tgatcagngg aaaagtgaag atttctagta tctagcacta acgtatgacc 300
 caactttgag ggatcacaag ctagaacaag ttgaggattt aaaatcctgg ataattatat 360
 acttaaagtt catgagcata aagctcactt gaccatgcag aaatgctggg aagcagggtg 420
 catggcatgg gaatacatct 440

<210> 527
 <211> 124
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(124)
 <223> n = A,T,C or G

<400> 527
 ttcccatatg tctgttgggt gcataaatgn cttcttctga gaagtgtctg ttcctatcct 60
 ttgccccctt tttgaggact taaatgttag acctagacc ataaaaacc tagaagaaaa 120
 ccta 124

<210> 528
 <211> 162
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(162)
 <223> n = A,T,C or G

<400> 528

ctgcgggaga	aatatgggga	caagatgttg	cgcangcaga	aaggtgaccc	acaagtctat	60
gaagaacttt	tcagttactc	ctgccccaa	ttcctgtcgc	ctgtagtgcc	caactatgat	120
aatgtgcacc	ccaactacca	caaagagccc	ttcctgcagc	ag		162

<210> 529
 <211> 409
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(409)
 <223> n = A,T,C or G

<400> 529						
cctttaaaat	atagcttata	aaatgtatac	tatnngccag	gagagctcac	atTTTTctgc	60
agTTTTccag	tggacctgcc	tatggaatac	tgtaaagaaa	aatctgcaaa	aatattccta	120
gcaattgaat	cagtgcTTTT	aaataaaaaga	agtggagagg	ggcttgggta	aattattctg	180
acaagtTTTT	ttgctagtgg	ttgccaaaat	taaggatatt	tgaagtgtcc	tatcacccaa	240
atttggcttt	aagaaaaagc	tatattctgn	gtctataggg	tgaagccac	actatctgtg	300
ctgcattctc	aatgatacaa	tacctatctg	gaaactttcc	tgttttgcca	atgggtgcac	360
aaatctaaaa	cattttatca	caaaaggtag	ttgaatttaa	atTTTctttt		409

<210> 530
 <211> 325
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(325)
 <223> n = A,T,C or G

<400> 530						
ccgccagtgt	gatggatatc	tgcagaattc	gccctttcna	gatttgngcc	cgggcaggtc	60
catggctagg	attatagata	gttgggtggg	tggggnaaat	gagtgaggca	ggagtccgag	120
gaggtaggtt	gtggcaataa	aaatgattaa	ggatactagt	ataagagatc	aggttcgtcc	180
tttagtggtt	tgtatggcta	tcatttggtt	tgaggttagt	ttgattagtc	attgttgggt	240
ggtaattagt	cggntgttga	tganatattt	ggagggtggg	atcaatagag	ggggaaatag	300
aatgatcagt	actgcggcgg	gtagg				325

<210> 531
 <211> 173
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(173)
 <223> n = A,T,C or G

<400> 531						
ccaattgatt	tgatggtaag	ggagggatcg	ttgaccncgt	ctgttatgta	aaggatgcgt	60
agggatggga	gggcgatgag	gactaggatg	atggcgggca	ggatagttca	gacggtttct	120
atttcctgag	cgtctgagat	gttagtatta	gttagttttg	ttgtgagtgt	tag	173

<210> 532
 <211> 395
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (395)
 <223> n = A,T,C or G

<400> 532
 caggtcctac tatgggtggt aaatttttta ctctctctac nggggtttttt cctagtgtcc 60
 aaagagctgt tcctcttttg actaacagtt aaatttataa ggggatttag aggggtctgt 120
 gggcaaattt aaagttgaac taagattcta tcttgacaa ccagctatca ccaggctcgg 180
 taggtttgtc gcctctacct ataaatcttc ccactatttt gctacataga cgggtgtgct 240
 ctttttagctg ttcttaggta gctcgtctgg ttctgggggt cttagctttg gctctccttg 300
 caaagttatt tctagttaat tcattatgca naaggatatag gggntagtcc ttgctatatt 360
 atgcttggnat ataatttttc atctttccct tgcgg 395

<210> 533
 <211> 290
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (290)
 <223> n = A,T,C or G

<400> 533
 ctgaaccatt atgggataaa ctggtgcaaa ttctttgcct tctctacttc tcaactgattg 60
 aacataagct tccagggctc ccctgaaaac caaaatgaaa acaatgtcaa aatattagat 120
 aaatcacata aaacagttta ggggatacca atatataaaa attattaggt aagctcattt 180
 ctggaactgt taatgctcgg ttccacaatc caagnngacc aacagccttc actcagntac 240
 tggngagtnt actatgggta ctacngntac taccttttagt gtnaaaaact 290

<210> 534
 <211> 334
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (334)
 <223> n = A,T,C or G

<400> 534
 ccgccagtgt gatggatata tgcagaattc gcccttagcg agnnagccgg gcagggtccat 60
 ggctaggttt atagatagtt ggggtggttg tggggnatga gtgaggcagg agtccgagga 120
 gggtantttg tggcaataaa aatgattaag gatactagta taagagatca gggtcgtcct 180
 ttagtggtgc gtatggctat catttgtttt gagggtagnt tgattagnca ttgttggng 240
 gtaattantc ggctgttgat ganatatttg gaggtgggga tcaatanagg gggaaatana 300
 atgatcagtn ctgcggcngg tnnagacctn gcc 334

<210> 535
 <211> 557
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(557)
 <223> n = A,T,C or G

<400> 535
 nccataagct tcagtgcgca aaagggtcaag gccagtgtta atttgttatt tcttaaataa 60
 ctttcccttt cattttttaa ttataaattt aacttctaac atgttttatg gttaaaattg 120
 tacttttttc ctttagcgac attcaaatgc atcacaatca ctttgtgaaa ttgttcgcct 180
 gagcagagac cagatgttac aaattcagaa cagtacagag cccgaccccc tgcttgccac 240
 tctagaaaag tatgtgtaaa actctgttct tgttcttctt tcatattgat gctgttccat 300
 gtgttaccat tgtgagtggg ttgtaagtgt tccttatgtg ggaatcatgt gccttgaaaa 360
 taaccttggg tgggtgagaa ggtagggaaa cctgcttctt ttatctcaag taaaagtttt 420
 ggcagggtaa agaagataaa tgacatttat atctagactt ttgagttttc caattatttg 480
 gtaaaaatgg gaaattctgt agaagccctt ccttaaaaat gggggaagtc catttnanaa 540
 aattaactgg taggtca 557

<210> 536
 <211> 372
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(372)
 <223> n = A,T,C or G

<400> 536
 gttccaacct tcattttctga aactgttcta gagcacngtg tctttctcgt agttcataac 60
 ttaccoccttc agtctagaat tagaattaca ttatctgttt tactacttta ctagactgta 120
 agctcctaga agataaggac tagggagttc atctctgtat tccaccagaa ggtacagtga 180
 ctcatatcta gagtcttttag atgaaactta ctgagttgaa taacttaata tttttctggt 240
 ttcatccca agggaggcca tgtctggaga tagacctga atttaataaa ttttaggcac 300
 tataccattt cagtggagaa aattgttggg aaatttgggg ggatggatat ataaggggga 360
 ggaagtcact gg 372

<210> 537
 <211> 284
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(284)
 <223> n = A,T,C or G

<400> 537
 ccttctgatg caaacagaaa ggaaatgttg tttggangcc ttgctagacc tggacatcct 60
 atgggaaaat ttttttgggg aaatgctgag acgctcaagc atgagccaag aaagaataat 120
 attgatacac atgctagatt gagagaattc tggatgcgtt actactcttc tcattacatg 180

acttttagtgg ttcaatccaa agaaacactg gatacttttg aaaagtgggt gactgaaatc 240
 ttctctcaga taccaaaca tgggttaccc agaccaaact ttgg 284

<210> 538
 <211> 293
 <212> DNA
 <213> Homo sapien

<400> 538
 gtacatagta ggtgtatata tttatgggct atataagatg ttttgatata ggcattgta 60
 gtgaaacaag cacatcaaca agaatggggt atccatcccc taaaacattt gtcctttggg 120
 ctacatgtca tttcctaattg taaagaaaat ggacagacag aaccaacatt gatttgactg 180
 ggtgaaaaag tccattttgag ttgggagcag ggggtgtgtt cctggatttg ggttggttagg 240
 acagtgtaaa aaggcttcac aggggaacat tcttttctga taaaggaaag cag 293

<210> 539
 <211> 468
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(468)
 <223> n = A,T,C or G

<400> 539
 tttcnataaa ctttattttt agagcagttt taagnnggta gcaaaattga ttagaaggna 60
 cagagatgtc ccatacacct cctactccca cacatgcaca gccttcccca ttatcaatag 120
 cccccaacag agggatacat ttgttaacaa ctgacgaacc tacatatcat tatcacccaa 180
 agtccacagt ttatattatt ctttctggag aattttcaaa tacagaaatt cctctaccag 240
 gaataaacta ncaatttcct ctcggtttt tataaattta attattattt cagaaattag 300
 cctatcttta caggagaaaa tgttataaac catgaaaaga ctatcaaata cacaaggaag 360
 tgaatgntat ataaaaaatg taccatctcc taaacaacta cctgcattcc cttcttggtg 420
 gtaagttata atttgnnata gttctgatca tctgtttaat taatttgc 468

<210> 540
 <211> 397
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(397)
 <223> n = A,T,C or G

<400> 540
 ctgttttatt aattcccca tttgcagcac acttntctct tccaacattc atcagtcaga 60
 tcagagtcca cggctttttc aaaatttaga taaactggct tacattttgt aatgatgtcc 120
 ccagacaaca cccactcca acccattctg tttgttacta ttagtttaca acatgcatgt 180
 gcctttactt tcattttcat agtattttaa aatggaaggg cactcccaa tttactttaa 240
 cccctttaat aatctctctc ctctgctct ctctggctct ccagacaact gttgatttac 300
 tttcctttat gatggattag ttgcatctt ctagaatttt atatgactga catataaagn 360
 ttttatgttt ctcccctttg ggtttcttca tgtggca 397

<210> 541

<211> 248
 <212> DNA
 <213> Homo sapien

<400> 541
 cctagatagg ggattgtgcg gtgtgtgatg ctagggtaga atccgagtat gttggagaaa 60
 taaaatgtgc atagtggggg ttttatttta agtttgttgg ttaggtagtt gaggtctagg 120
 gctgttagaa gtcctaggaa agtgacagcg agggctgtga gttttagggtg gagggggatt 180
 gttgtttgga aggggggatgc gggggaaatg ttgttagcaa tgagaaatcc tgcgaatagg 240
 cttccggc 248

<210> 542
 <211> 366
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(366)
 <223> n = A,T,C or G

<400> 542
 aatcggccct ctatgatcat gctcgagcgg ccgccagtgt gatggatata tgcagaattc 60
 gcccttgagc gatanccggg gcagggtccaa ttgatttgat ggtaaggagg ggatcgttga 120
 ccnctgtctg tatgtaaagg atgcgtaggg atgggagggc gatgaggact aggatgatgg 180
 cgggcaggat agttcagacg gtttctattt cctgagcgtc tgagatgtta gtattagtta 240
 gttttgttgt gagtgtagg aaaagggcat acaggactag gaagcagata aggaaaatga 300
 ctatgagggc gtgatcatga aagggtgataa gctcttctat gataggggaa gtagcgctctt 360
 gtanac 366

<210> 543
 <211> 460
 <212> DNA
 <213> Homo sapien

<400> 543
 cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
 gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
 aattttaaagt tgaactaaga ttctatcttg ggcaaccagc tatcaccagg ctcggtagggt 180
 ttgtcgctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
 agctgttctt aggtagctcg tctggtttcg ggggtcttag ctttggctct ccttgcaaag 300
 ttattttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
 tggttataat ttttcatctt tcccttgagg tactatatct attgcgccag gtttcaattt 420
 ctatcgctta tactttattt gggtaaattg tttggctaag 460

<210> 544
 <211> 116
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(116)
 <223> n = A,T,C or G

<400> 544
 ccgccagtgt gatggatata tgcagaattc gccctttgga gngctngcgc ccgggcaggt 60
 ctgtttcagc agctcctcct tcttcttccc gcgangatct cgagccttga tcttgg 116

<210> 545
 <211> 380
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(380)
 <223> n = A,T,C or G

<400> 545
 cgacggatcg atnagctnga tatcgaattc ggacgagcat ggcgtattgc tgcagatatg 60
 gattcttcag aatgctccat gacaaatgta ctgacgggaa gncnatctaa aggaggcatt 120
 gtnatgagag aaaggtctcg agctccagat aaagagagat acagagttct tggaattgga 180
 gttgcagaaa cagtaagaca atcgattgtg gggaagcggt cttttagaga atctttggcc 240
 ttcactccaa agcgttggtt ttcattcaata ataagtagct cgtgccgaat tcctgcagcc 300
 cgggggatcc actagttcta gagcggccgc caccgcggag gagctccagc ttttgttccc 360
 tttagtgagg gttaatttcg 380

<210> 546
 <211> 418
 <212> DNA
 <213> Homo sapien

<400> 546
 ccagggcaat taggcaggag aaggaaataa agggatttca attaggaaaa gaggaagtca 60
 aattgtccct gtttgcggat gacatgattg tataatctaga aaacccatt gtctcagccc 120
 aaaatctcct taagctgata agcaacttca gcaaagtttc aggatacaaa atcaatgtac 180
 aaaaatcaca agcattctta tacaccaata acagaccaac agagagccaa attatgagtg 240
 aactccatt cacaattgct tcagagaata aaatacctgg gaatccaact tacaagggat 300
 gtgaaggacc tcttcaagga gaactacaaa ccactgctca aggaaataaa agaggatata 360
 aacaaatgga agaacattcc atgctcatgg gtaggaagaa tcaatatcat gaaaatgg 418

<210> 547
 <211> 172
 <212> DNA
 <213> Homo sapien

<400> 547
 cctgaggttg ggagaaattt tgtccatttc tttagaacca aaattggcaa ccagagagta 60
 tttggatgtt acacaaaata tctagtttcc ctttctagcc taaattgggt tgtttatagc 120
 acccgtctct ccatttgaga aaaatgggta ggatgctggt gcagggatga gg 172

<210> 548
 <211> 367
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(367)

<223> n = A,T,C or G

<400> 548

ggtctgactt	aagagaaaca	atggaaggca	agaggcagta	gaataatata	ttcaaaagat	60
gcaaaggaaa	aaaacctctc	agccacgaat	tccttatcca	gcaattattt	ttcaaaaatg	120
aaaataacac	aaagacttag	ccagataaac	agaaacatta	actgaagttg	ttgctggcag	180
acctaccata	taaaaataaa	aaactctaaa	aaaattccta	tggtctaaaag	caagttacag	240
aagacagtca	cttgaatcca	catttttaaaa	aaagcactga	tatacgtaat	attgacatta	300
taaaagacag	taaaaatgca	tttcttcttt	ataataaatn	gcttattaaa	taacatgtgt	360
ataatgg						367

<210> 549

<211> 418

<212> DNA

<213> Homo sapien

<400> 549

ccaaatcaga	acctagagtg	agcattctat	aaactcacct	ttgctttgat	ccttgaagat	60
cacaagtttt	gatactgttg	aaatctctac	tctttcaaca	ctttaattaa	atggcattta	120
gaatttcata	tacttctgtt	gttgtttcca	caatcttaaa	ctggatttag	aaatacttat	180
aatgtaaatg	caagagcttt	aacttagtaa	ccgtatttcc	tattttttgt	tgtttttctt	240
ttgccagaat	ttctgtttgt	ctacaataaa	gtccagcgaa	atacagtatt	tggttagggt	300
acttggtaac	ataaaatttt	atcatttgta	gagtttttac	ttaaccttcc	tattctctag	360
tctctataat	ctttcaatga	agataaccag	ttacgaatat	ctcctatacc	atattagg	418

<210> 550

<211> 234

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(234)

<223> n = A,T,C or G

<400> 550

cctaccgccc	gcagnactga	tcattctatt	tccccctcta	ttgatcccca	cctccaaata	60
tctcatcaac	aaccgactaa	ttaccaccca	acactcacia	caaaactaac	taataactaac	120
atctcagacg	ctcaggaaat	agaaaccgtc	tgaactatcc	tgcccgccat	catcctagtc	180
ctcatcgccc	tcccatccct	acgcacccct	tacataacag	acgagggtcaa	cgat	234

<210> 551

<211> 542

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(542)

<223> n = A,T,C or G

<400> 551

caccctacc	ccnntcctca	taaaagttnc	tctccctgga	tcctcttttt	ccctcatgag	60
tgcccgggtg	cccaagtcaa	aaacctggga	gtgatataaa	ctccccacac	atccagtcag	120
tcactcatca	actctattga	ttctgtctgc	taaatatatn	tcaattgtat	taacttaaac	180

atatgcatan	ggcactttct	tcttcactgc	atTTTTgtgg	gctgcactta	cctttcaggt	240
aacgacaaca	ctggccctc	ttgcccttct	agtcagaagt	gccaaaatga	tgagagctag	300
ccatgacaaa	cccacagcca	acattacact	gaatgtgcaa	aactggaagg	gcatccaaac	360
agaggagggg	agagaggaat	agacaggaag	tcaaactgtc	tctgtttaca	gatgacatgt	420
ttctatatct	ataaagcccc	atagtcttgg	cccccaggct	tcttctgctg	ataaacttta	480
gcaaagtctt	agcatacaaa	atcaatgtgc	aaaaattact	aacagtccta	tacatcaagt	540
ca						542

<210> 552
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

<400> 552						
cctggntgac	aaggagggtgc	ctgtnatgtg	aagatttgag	gaaagagcat	tccaggcagg	60
gggaaggctt	gatgcaaagg	gtctactgca	ggcattagct	gagcttattt	aaagatcaga	120
atgaaggcca	ttgtggctag	aacagagtgg	acaggaagga	atggtaccag	gcaaagctga	180
agaagttggc	aggattgagc	tctcataant	catggcaaag	agttcccatt	tcattgtttg	240
acggaaataa	attggaaggt	cttaagtagg	agaagatttg	attagattta	cattttacga	300
agaagcactc	tggatgttat	gtgaagaaat	ggcctttgca	gggcaagggt	ggaaacaaag	360
agatcagtta	ggaaattatt	ggagtagctg	aggattggat	gaggggatgt	g	411

<210> 553
 <211> 631
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(631)
 <223> n = A,T,C or G

<400> 553						
ccgggattag	aactaaaaca	agtgagatca	cccctcta	tatttctgaa	cttggttaat	60
aaaagtttat	aagattttta	tgaagcagcc	actgtatgat	attttaagca	aatatgttat	120
ttaaaatatt	gaccttccc	ttggaccacc	ttcatgttag	ttgggtatta	taaataagag	180
atacaaccat	gaatatatta	tgtttatata	aatcaatct	gaacacaatt	cataaagatt	240
tctcttttat	accttctca	ctggccccct	ccacctgccc	atagtcacca	aattctgttt	300
taaatcaatg	acctaaagtc	aacaatgaag	tattttataa	atgtatttat	gctgctagac	360
tgtgggtcaa	atgtttccat	tttcaaatta	tttanaattc	ttatgagttt	aaaatttgta	420
aattttctaaa	tccaatcatg	taaaatgaaa	ctgttgctcc	attggagtag	tctcccacct	480
aaatatcaag	atggctatat	gctaaaaaga	gaaaatatgg	tcaagtctaa	aatggcta	540
tgctctatga	tgctattatc	atagactaac	gacntttatc	ttcaaaacac	caaattgtct	600
ttagaaaaat	taatgtgatt	acaggtagag	g			631

<210> 554
 <211> 558
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(558)

<223> n = A,T,C or G

<400> 554

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ccaggntagt ctccaactcc tgaccttagc tgatccaccc acctcggcct cccaaagtgc      60
tgggattaca ggcatgagcc actgcgcccg gccaaacttg atatgcattt ttaaataagt      120
taatacatta ttcattggtt agtctcatta tatattctat ggtccacttt gaaatttcac      180
ctaaccaaaa tcatcttcat cctgcaattt gaggtttgga cacaatgggg attgatcagt      240
aattttcttca tatgcccttt ctcaaggaaa tagtttctta tgaaaaaaaa gtcctatggt      300
ttcatgtaag ttctcttttt ggagaagaaa aggagacatt cttacttagc actctcagtt      360
ttacaaaacg ctgccaacct taaaatttgt ctattgattc ccaaggcaca caaccaatag      420
tctgtcaata acccggaata acatttcttt aaggccccag taactttcac atgtttgggt      480
tccaatcctc acctagaatc ttgttaagaa aagtaaacca ttcactcctc tagaaactct      540
aaggttgctt cttagggg

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<210> 555

<211> 212

<212> DNA

<213> Homo sapien

<400> 555

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ccaggatattt gcataatggc ttttcttctg ttgcctttgt tcctttgtgg cccagctaa      60
ttgcctgaga gtgccactgt tagttttcaa ctctttctga tagaaaccct gtgtactaac      120
atggaaatct taggtaatct gctttttcaa agcacaatgc agaatttatt ggcgggtggtg      180
taactttaag aatatccgag aagccaccaa gg

```

<210> 556

<211> 219

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(219)

<223> n = A,T,C or G

<400> 556

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ccatgtgtct atctggagag aaggggaaac agcaagtgca aaggccctga gatggaacat      60
atctggagaa ttcgaagaat ggtaagaagg ccagagtgga gcagaacaag tgtgggagag      120
agttgtagga gatgagatca aaggctagga atgaagtgta aggccatgtc atgtgacctt      180
gtatgtcctt gtaaggcttt tttttttttt ttttancct

```

<210> 557

<211> 482

<212> DNA

<213> Homo sapien

<400> 557

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cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga      60
gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca      120
aattttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt      180
ttgtcgcttc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt      240
agctgttctt aggtagctcg tctggtttcg ggggtcttag ctttggctct ccttgcaaag      300

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ttattttctag	ttaattcatt	atgcagaagg	tatagggggt	agtccttgct	atattatgct	360
tggttataat	ttttcatctt	tcccttgcg	tactatatct	attgcgccag	gtttcaattt	420
ccatcgccta	tactttattt	gggtaaatgg	tttggctaag	gttgtctggt	agtaagggtg	480
ag						482

<210> 558
 <211> 679
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(679)
 <223> n = A,T,C or G

<400> 558						
ctgtnaaaat	tctgaaccta	tccccaaaag	aaaaaccgtg	aaatacaagt	tttagggaggt	60
ggagcaaaga	aaagccaagt	tattttaaac	caataaacac	aagagacaat	tctgctggag	120
aatttacttt	ctccaaaaca	tcaaatggac	tttaaagcag	aagaccacat	tttatgagaa	180
agttatgtca	ctgaaaagct	tcatgtaaag	tgactttgta	aatggaatat	ttttaaatga	240
taaaaagaaa	ataacttttc	caggaatcct	ttggagaggc	tgataaccag	atattaaatt	300
atcaattttg	ccaaagtgga	cttttaaaaa	atgtgttact	tttaaaaact	aacttgaaag	360
aatttatgag	gcaatctatc	tgagtatggt	tattgttgct	ccattggctt	tcaggatttt	420
ggtcatttca	ctgttaactc	ttacatcaga	gaataaagaa	aagaaaatga	aactttgtta	480
ggaactggga	tggaaaatgt	agtcccagac	agatctactg	acctcgactg	agtttcagaa	540
atatcccagg	attttgggta	ttcatgcctt	tcttttggtga	ctttctttca	aattagccaa	600
ttaaagatac	cccttcaatc	accggtgaca	tcagtacaac	agtttttcaa	cagttttctc	660
tctcctgacc	aaacagttt					679

<210> 559
 <211> 488
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(488)
 <223> n = A,T,C or G

<400> 559						
ccccactgta	ctccagcctg	ggtgacccca	tctcaaagaa	gaaaagttac	cagatgtcat	60
gggttaaagg	tggctttcaa	gtggcctcat	aagttgtctt	gcattttaat	tcagggaatt	120
cattggacca	atagggttaca	ttttcggtcc	ttttttgttt	tggttcatct	gttaagcagt	180
gggggcctaa	ttactgctcc	tttgtaaaaa	cacattttcc	caaagaacac	tgaattaccg	240
ttcaaactgg	ttgttgatgg	gtaacaaggg	ctgtttttgc	tgccccaaaa	gggcttaaca	300
atttaggcgg	atagtttact	taaaaaaaaa	aatcctttgg	agacatactg	aaaatgcaaa	360
ctagtttcta	aattatcaat	tccttacatg	aanaagcagt	ttgccanagt	ttagtctcan	420
aaaatgactg	gttggtctcta	tttaaatcan	aacccaattt	ctacgcacct	gcccgcgccg	480
ccaagggc						488

<210> 560
 <211> 602
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(602)

<223> n = A,T,C or G

<400> 560

cctantttaag	aattccttgc	cttagtggtg	aacaaggact	aaacacagac	aatgggtgaa	60
acacagacgc	taattcacat	aacagagagt	aggcaacctt	aagaatgaat	tgatgcagac	120
tcctatagaa	ttcctctgtt	atgactgggt	tcttattttc	tcctccttgt	atgtagtga	180
aatttcatca	ttatgaatag	ttccttggat	ctttttttta	agttgtgaat	gcgagtgttt	240
ggctttgtaa	tacaactttt	tagtatccag	aagataacca	gtgctctacc	aataaagatc	300
ttttgataca	aagggtttta	acttctgcc	gttcttactc	atttttttca	ggttttttat	360
acatttctta	aacaacacat	acattatgta	aaatataaga	attaatgtac	attctcaagg	420
ccagattcag	tgacaaaatg	cactaccgga	atctagtaac	acatttactc	cttgctgcat	480
ataagtggcg	tgtaagaaat	acaggggtata	ttgttttgtg	atccatgcag	taaagtgtca	540
caaatatcag	gcaaacaact	agacgntctt	cagctactaa	aattaactgt	cccagtcaca	600
aa						602

<210> 561

<211> 683

<212> DNA

<213> Homo sapien

<400> 561

gtctatTTTT	aaaaagaaag	aaaaaaacca	cttttttata	gtccctagct	ttgccatatg	60
cccgcttaa	gtggaaggaa	agttaatcac	ttaactatgt	tttataaaaa	gaaaaaagg	120
cttggaatgc	tattactgtt	cacacaaagt	atgattctgt	ttgaataagg	caaagtctcc	180
tttttttaaa	aaaagacatt	actgtaatat	caaaaaccgt	ggcagtttgt	atacaactct	240
gggcttgatt	tttttttaaaa	aaacagaatg	aattgatgtc	ttattttata	aatgttctat	300
atattattagg	agaaaaacttt	atattgcctt	ttttatcaat	catgtaacag	gcttatagct	360
ttccaacaga	gctgcttgcc	aaacaatttt	ttttgtttat	taaacagtgc	tgaaacaaac	420
aggatcagca	tttacttaag	atgttaagaa	tgaggacttt	taatcagccg	aaccaagata	480
ttgttacctg	tatgcattcc	caaagtctag	atgctcagta	tgttcagtc	tatctttcag	540
aatcagtgaa	ccgattaccc	tttttttgg	attcactcta	catctgccaa	cctagttcac	600
cttggttttg	tgtctgctgt	agaagggaac	cataacttgg	ttaaaccgta	gggattatca	660
ttgtatacat	gctgtgaaca	tgt				683

<210> 562

<211> 420

<212> DNA

<213> Homo sapien

<400> 562

gcactTTTT	tccagtaagg	attcatctct	tgctctccta	tatggtcatt	atattttata	60
ttttacatat	ttataaacat	gacatatgta	tttatgttcc	acaaagggt	ttgaatagaa	120
tttacacata	gagttccctg	ggttgatgtg	tttatcaaaa	tggaagataa	agtgaattaa	180
ttacttaaat	atttaacact	attgaataga	aataatttcc	ccaatattgc	ttcatgattt	240
agacagtcta	ttaaatgttt	aagcaaggca	ctagactaag	tttattaaga	caaattttgg	300
aatatgtgca	gaaatatgac	ctggctaata	gtacagagtc	aaagctgggt	gaatgggtgt	360
atatagtgga	ttcagattga	tgtggcagtg	gtggttacac	taggggcact	aaggttatcc	420

<210> 563

<211> 482

<212> DNA

<213> Homo sapien

<400> 563

ctccacctta	ctaccagaca	accttagcca	aaccatttac	ccaaataaag	tatagggcat	60
agaaattgaa	acctggcgca	atagatatag	taccgcaagg	gaaagatgaa	aaattataac	120
caagcataat	atagcaagga	ctaaccctta	taccttctgc	ataatgaatt	aactagaaat	180
aactttgcaa	ggagagccaa	agctaagacc	cccgaaacca	gacgagctac	ctaagaacag	240
ctaaaagagc	acacccgtct	atgtagcaaa	atagtgggaa	gatttatagg	tagagggcag	300
aaacctaccg	ggcctggtga	tagctggttg	tccaagatag	aatcttagtt	caactttaac	360
tttggccaca	gaaccctcta	aatccccttg	taaatttaac	tgtagtcca	aagaggaaca	420
gctctttgga	cactaggaaa	aaaccttgta	gagagagtaa	aaaatttaac	acccatagta	480
gg						482

<210> 564

<211> 302

<212> DNA

<213> Homo sapien

<400> 564

ctggaagtga	aggtactaat	atacaaattg	ctcttgtttc	tgaatatgtg	atataatttg	60
tgaatctttg	gaaactgaat	tttttctatg	gagtgc aaat	atagaagggt	tattttacaa	120
tgtttggtgt	gaaaagaatt	cactttgtaa	acaactatta	aggctggaag	tttagtgaag	180
gtgcatagtt	ttgaaagcta	cacaggtgaa	aaatcaaact	tattgtttgt	aattttgctg	240
ttacatgtta	agttactttg	acagcaattt	tctaatagata	atgtgattta	tgatttaaaa	300
gg						302

<210> 565

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(554)

<223> n = A,T,C or G

<400> 565

ccanngtgac	atcatggcaa	tacagcaaga	attctgnnat	ttatttagaa	gcctcaagga	60
gaaggatcct	ggagcccctg	aatgagagtt	tcttctccat	gcctctcccc	agtcaaaata	120
catggaaata	ttcatagaag	cattgtaccc	agcatgataa	ggaaggatgg	agaatggttc	180
cttatatctc	tgttcacaag	acatcaacac	tcttaagtaa	ctgtatgaaa	taaattctct	240
gctgaaagca	aataaaccat	ctgaaaggtc	ttctggttac	ttacacagat	ttcctagaga	300
atctgaaatc	agcctaacag	ggaagattaa	tttttaaattg	aatccaagtt	aatgaaagca	360
aagaactctt	atacagaaat	acattttcct	attataaagc	aggactacct	tccttaattt	420
ctgatagacc	taggacaatt	tgaatgggca	ttgaaattct	tttggttgaa	ttacgcaaac	480
aagcaaagga	aaagtctcaa	ttattattgg	aaaatttggg	gagagattat	tatctcttga	540
tctcctagtn	natt					554

<210> 566

<211> 631

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(631)

<223> n = A,T,C or G

<400> 566

ncgaagctgt	gaanncattc	acacggaatc	tgganggtat	tactgtaact	tcttataata	60
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gattctcaaa	agcaatggct	atttaacaag	atgtaaaagg	acaataacat	atcaaagaac	180
tttcacacac	ctaaagatag	catttagcag	caagttagtc	agacaaaaca	aacataaata	240
tcttcacatt	tcctatgttt	gtttttaact	ttacttcata	aagccactga	taattgaggt	300
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tgtttttctg	agtacttttt	acacagaata	tttttattaa	aatcagttct	aattcattta	480
tgcagattag	gggaaaatga	ttcataataa	attaacttta	aaattacctt	ctatctgctt	540
ctacctctat	ccccccatca	ccaccaaatc	tgttgctaca	gtgaactgta	gccaatgtct	600
gtttgagggg	gcccaaagca	tctggtaatc	t			631

<210> 567

<211> 510

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(510)

<223> n = A,T,C or G

<400> 567

cctatnatag	cttctctagc	tatcatactc	caatcagcna	aaaatgagaa	aatgttgaga	60
aatagaagat	aattcctcat	ttaaggncac	cttctanaat	ttgtgcttaa	nantctgttt	120
tcttctcatg	ggccagcact	tcggcaactg	ggaaaaatta	ngngtacagg	gatctaggna	180
atactgttta	tttgagcaat	aatatattgn	gctaacgttc	aggcatccta	ttactgagaa	240
ataagggaaa	atgagtgtaa	agtacaacta	agagtctcgg	ctacagggaa	aaataccatc	300
agttaaatat	ccatagtcct	agagcattta	tgtaaaactg	caatttgaat	cctgcaatac	360
attttggtct	tttctcagt	gataccatgt	gtgggaagtt	gttctgtcaa	ggtaggtcgg	420
ataatttgcc	ctggaaagga	cggatagtga	ctttcctgac	atgtaaaaca	tttgatcctg	480
aagacacaag	tcaagaaata	ggcatggtgg				510

<210> 568

<211> 180

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(180)

<223> n = A,T,C or G

<400> 568

ttaatntgac	ncacgcttat	gcggaggaga	atgntttcat	gttacttata	ctaacattag	60
ttcttctata	gggtgataga	ttggtccaat	tgggtgtgag	gagttcagtt	atatgtttgg	120
gatttttttag	gtagtgggtg	ttgagcttga	acgctttctt	aattgggtggc	tgcttttagg	180

<210> 569

<211> 237

<212> DNA

<213> Homo sapien

<400> 569

ccaattgatt	tgatggtaag	ggagggatcg	ttgacctcgt	ctgttatgta	aaggatgcgt	60
agggatggga	gggcgatgag	gactaggatg	atggcgggca	ggatagttca	gacggtttct	120
atttcctgag	cgtctgagat	gttagtatta	gttagttttg	ttgtgagtgt	caggaaaagg	180
gcatacagga	ctaggaagca	gataaggaaa	atgactatga	gggcgtgatc	atgaaag	237

<210> 570

<211> 352

<212> DNA

<213> Homo sapien

<400> 570

ctgtctctcc	atthagagcc	ccagttggtc	ctgacctctt	acaaatttgg	tgttttcact	60
ttgatgttta	tgaaccgatt	gcattaaaaa	tgcaggataa	tgattcaggg	ttagagaaac	120
tattatttat	acaaatgtgg	ttaacacctc	atcattttta	attggctgtg	ctaataatgc	180
tcattgtgct	cttcagggtt	atgtgtgtgt	gtgtgtgtgt	gttttgcttg	aatctgcaac	240
ctacatttgc	tctggcagta	tgttgagtat	atgctagaat	agaatggacc	taggcaactc	300
taaggtccta	caactaaata	cacttactta	ggaaacctcc	taaataagta	gg	352

<210> 571

<211> 402

<212> DNA

<213> Homo sapien

<400> 571

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atattatact	aagaaaagat	acgactttat	tttctggtag	atagaaataa	atagctatat	120
ccatgtactg	tagtttttct	tcaacatcaa	tgttcattgt	aatgttactg	atcatgcatt	180
gttgaggtgg	tctgaatgtt	ctgacattaa	cagttttcca	tgaaaacggt	ttattgtgtt	240
tttaatttat	ttattaagat	ggattctcag	atattttatat	ttttatttta	tttgtttcta	300
ccttgaggtc	ttttgacatg	tggaaagtga	atttgaatga	aaaatttaag	cattgtttgc	360
ttattgttcc	aagacattgt	caataaaaagc	atttaagttg	aa		402

<210> 572

<211> 70

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(70)

<223> n = A,T,C or G

<400> 572

tggatccgag	ctcggtacca	agcttggcgt	aatcatgggtc	atagctgttt	cctgtgntcg	60
ttttacaacg						70

<210> 573

<211> 423

<212> DNA

<213> Homo sapien

<400> 573

ccaatgggtt	cttagtgaaa	gagtacacta	gctctgaatg	caatgccctc	agaaagatat	60
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cattcataga gacatacaaaa gcacatggca acatgacatt ggaatacacg attctgagca      120
tcttcattca tgaccaacct ggctatagat ttcagatgtc ctcttggctc gaaggatata      180
tgggatatacc atgctcactt gcattccttt ccttttaatt tcattttcta agtccttctt      240
gtattgtttc taaaagaaca gaaaataatc ttggagcttt gcttaagctt taatagcgat      300
gttgaaattt acatgtttga atctcaaagc cacccatgtg gaaagaaaac ttatgctctt      360
tccagctatg attcacggca tttatttttaa actttgtatc ttgctgctgt cttacctggc      420
tgg                                          423

```

```

<210> 574
<211> 129
<212> DNA
<213> Homo sapien

```

```

<400> 574
ctgttaaaaag aacaaactta gcaatatata acagtttgct aacaggattt ttgactattc      60
actttgcgag ttattttttaa aaatccactt ttttactgag tcttactaca taccaggcac      120
tgtacttgg                                          129

```

```

<210> 575
<211> 684
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(684)
<223> n = A,T,C or G

```

```

<400> 575
ccagatntga cttttcaaaa ctactcacat tgtgaaaaan gcaggaacaa atctagtttc      60
aagttcagca tgccgttccc tgtttaattc ataaaacaca actggcagaa gtattacttg      120
aagcaaaaca aaagtaacgt gggaacttgc ttatttgcta agccacaatg tatttttcca      180
ggaatagcat aaatttgcca tctttcttgt gtctatggaa aaggggttta gaattgtttc      240
actaaaaatt aaatttctat attgtcaaac atgattgtat actcaaattt taaaatgtga      300
agggaacact tactaagcat ttcctgggta tgccactata ttaagtccta gtaatatgat      360
atagtttatt tcaatttttt ttcaactcat acttccttta aaatagcact gaccaaaga      420
aagttaacat gagcttcatg tacaattttt aatctttttg cagaaaaata aactgagaaa      480
ggctaaaatt gttttattta agccactata ccaagacata ttgatttcac caatataaaa      540
attgagatag ttacattttt ttggtacatc tttaaaatct ggtatgtatt tttatactga      600
cagcacatct caatttggac aagctacatt tccagggctc aatagtcacc atgaatctca      660
attgtaatca aagaggttgg cctg                                          684

```

```

<210> 576
<211> 134
<212> DNA
<213> Homo sapien

```

```

<400> 576
ccttattttct cttgtccttt cgtacagggg ggaatttgaa gtagatagaa accgacctgg      60
attactccgg tctgaactca gatcacgtag gactttaatc gttgaacaaa cgaaccttta      120
atagcggtcg cacc                                          134

```

```

<210> 577
<211> 133
<212> DNA

```

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(133)

<223> n = A,T,C or G

<400> 577

ctgtctctcc attnagaagc cccantnggt cctnacctct tacaaatttg gtgttttcac	60
tttgatgttt atgaaccgat tgcattaaaa atgcaggata atgattcagg gttaganaaa	120
ctattattta tac	133

<210> 578

<211> 200

<212> DNA

<213> Homo sapien

<400> 578

cctcaaactc atcttcaaag gtgaccacgc aatcagtgtc aatgccttta ctgtagtta	60
cctggtaatt tcattcttta gtctctccaa gaaaatctga agtgtattag gcaagtcaga	120
acccaaattg tctccaaggt tgcaataat ttgtcccata caggaaatag ccctttcctt	180
gacttctga tcaatgtcag	200

<210> 579

<211> 402

<212> DNA

<213> Homo sapien

<400> 579

ctgattttta caataactac tgtgttctcg gcaatagtgt gttctgatta gaaatgacca	60
atattatact aagaaaagat acgactttat tttctggtag atagaaataa atagctatat	120
ccatgtactg tagtttttct tcaacatcaa tgttcattgt aatgttactg atcatgcatt	180
gttgaggtgg tctgaatgtt ctgacattaa cagttttcca tgaaaacgtt ttattgtgtt	240
tttaatttat ttattaagat ggattctcag atatttatat ttttatttta tttgtttcta	300
ccttgaggtc ttttgacatg tggaaagtga atttgaatga aaaatttaag cattgtttgc	360
ttattgttcc aagacattgt caataaaagc atttaagttg aa	402

<210> 580

<211> 245

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(245)

<223> n = A,T,C or G

<400> 580

ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt	60
agggatggga gggcgatgan gactaagatg atggcgggca ggatagttca gacngtttct	120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg	180
gcatacagga ctaggaagca gataaagaaa atgactntta gggcgtgatc atnaaanggg	240
ataaa	245

<210> 581

<211> 294
 <212> DNA
 <213> Homo sapien

<400> 581
 tgcagcgcaa gtaggtctac aagacgctac ttccccctatc atagaagagc ttatcacctt 60
 tcatgatcac gccctcatag tcatttttctt tatctgcttc ctagtcctgt atgccctttt 120
 cctaacactc acaacaaaaac taactaatac taacatctca gacgctcagg aaatagaaac 180
 cgtctgaact atcctgcccc ccatcatcct agtcctcatc gccctcccat ccctacgcat 240
 cctttacata acagacgagg tcaacgatcc ctcccttacc atcaaataca ttgg 294

<210> 582
 <211> 230
 <212> DNA
 <213> Homo sapien

<400> 582
 gaggtcgccc tcatagtcac ttcccttacc tgcttcttag tctgtatgc ccttttctta 60
 acactcacaa caaaactaac taatactaac atctcagacg ctcaggaaat agaaaccgtc 120
 tgaactatcc tgcccgccat catcctagtc ctcatcgccc tcccatccct acgcatcctt 180
 tacataacag acgaggtcaa cgatccctcc cttaccatca aatcaattgg 230

<210> 583
 <211> 481
 <212> DNA
 <213> Homo sapien

<400> 583
 ccaagggtgt tctgcctgcc tcagcctccc aaagtgctgg gattacaggt gtgagccact 60
 gtgcctgacc acaggaaaac ttattttaaat gagagatttg actcgaaaga tcccgttttt 120
 ttaaggctct tagttcttaa aagcggcaca taatagaatt agtataatcc caaataaatt 180
 ttcagtagat ttttggtgta acttgagaag atgattctgt catttttagt gacaatttaa 240
 aagacctgaa attgtctaca gccatagaaa gtgaactact gatagttgtt tctgtaaagt 300
 tttattggaa cacaaccaca cctatttggt catctgtatt gtctttgggt actttgtgca 360
 gagaccatgg cccacaaaacc taaaacattc actttctagc tctttaagaa ataattggcc 420
 cactgacacc ctgggtcttaa ggtctagacc aattatttct caagagtatt agctgaatca 480
 g 481

<210> 584
 <211> 306
 <212> DNA
 <213> Homo sapien

<400> 584
 ccaattaaga gctaaattta caaaataatc tctatcagga ggctttaagg tttaatgtct 60
 cttaaagtccc tatggatata agaggcttga atgtactgaa ttcaaatttg gtttttaaat 120
 gttataatag tttaggcccc agagccacat atttctgtct aagaatagaa agcatagcta 180
 gctgcccaca cagaatattc atatagaggt ggggggcaag aacaaaattt attcatttga 240
 tacatagaaa tgggactact tagaatagac tcataataga aagcatcatc tggtttctca 300
 tctcag 306

<210> 585
 <211> 308
 <212> DNA
 <213> Homo sapien

<400> 585

ccagaatggt acagagtgga ggggtgttctg ctaatgactt cagagaagta ttttaagaaaa	60
acatagaaaa acgtgtgcgg agtttgccag aaatagatgg cttgagcaaa gagacgggtgt	120
tgagctcatg gatagccaaa tatgatgcca ttacagagg tgaagaggac ttgtgcaaac	180
agccaaatag aatggcccta agtgcagtgt ctgaacttat tctgagcaag gaacaactct	240
atgaaatgtt tcagcagatt ctgggtatta aaaaactaga acaccagctc ctttataatg	300
catgtcag	308

<210> 586

<211> 416

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(416)

<223> n = A,T,C or G

<400> 586

cctgtctttg aatggatgaa atagggttaat aaaaaacatc actgttttaa aactagaaca	60
ctgaaaaatt ctaggaaagc ttattttccc ttatatattt atggnacttt caacacttna	120
caacactatt tnaattaann tttnttctag agtttatann atatcagtac attcttttct	180
gtggatgcaa taatatagaa tcttattnca aatcttactg gcaggntctn tttaaattctt	240
caacggntgn catagtgatt aacccaaatt agttatgatt tctgcctatc tgtgtgagaa	300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa	360
atgatgacag tcattttata tcaccttcaa ttaccaaca gcttttaata gtctgg	416

<210> 587

<211> 382

<212> DNA

<213> Homo sapien

<400> 587

cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga	60
gctgttcctc ttggactaa cagttaaatt tacaagggga tttagagggg tctgtgggca	120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtagggt	180
ttgtcgctc tacctataaa tcttccact attttgctac atagacgggt gtgctctttt	240
agctgttctt aggtagctcg tctgggttcg ggggtcttag ctttggtctt ccttgcaaag	300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct	360
tggttataat ttttcatctt tc	382

<210> 588

<211> 307

<212> DNA

<213> Homo sapien

<400> 588

cctactcttc tccgtccatt gtactatctg cccgtgggtg ggatggcagt aggatcatat	60
ttgatgactt ccgagaagca tattattggc ttcgctcataa tactccagag gatgcgaagg	120
tcatgtcctg gtgggattat ggctatcaga ttacagctat ggcaaaccga acaattttag	180
tggacaataa cacatggact aatacccata tttctcgagt agggcaggca atggcgctcca	240
cagaggaaaa agcctatgag atcatgagg agctcgatgt cagctatgtg ctggtcattt	300
ttggagg	307

<210> 589
 <211> 89
 <212> DNA
 <213> Homo sapien

<400> 589
 cctgggtgat tgaggatgca atgagctgtg attgtgccac cacactccag cctgggcaat 60
 acagcaagac tgtctcaaaa aaaaaaaaaa 89

<210> 590
 <211> 456
 <212> DNA
 <213> Homo sapien

<400> 590
 cctcagttct tgattgtggt tgacggggcg tcaccatgaa ggagcccatt tagtataaag 60
 cttccaacct tttctcttaa tcgtttcttt aatcttttaa accatcttca agtgcataagg 120
 ggagtttccg atgccagagg atgaaagcaa gtgctctctc caccctctcc tcccagagtg 180
 aaaacaaatc cttttgctga tacttgtttc aaaagcatcc attgtaaagc ttctcagtga 240
 cacaaaatac tgagaggtaa ctttttatca atcaaaccac ataccccaat ttaacacctt 300
 tcaatgctct gaattcaact gacagactaa aggggtgttc ctgtaacagt ctgaaatatt 360
 aagtgttttt tttgttttgt ttttaaactt tatttcagaa aacttcctct tggggtagga 420
 aagtacacat gaagcagcaa agtaacgaag aaaaaa 456

<210> 591
 <211> 289
 <212> DNA
 <213> Homo sapien

<400> 591
 ccaattgatt tgatggtaag ggaggggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
 agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
 atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
 gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaagggtg 240
 ataagctctt ctatgatagg ggaagtagcg tctttagtagac ctacttgcg 289

<210> 592
 <211> 435
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(435)
 <223> n = A,T,C or G

<400> 592
 cgcgttagat gcgccttttc cggcctgtgc gtctgctctg gttcctctca ggcagcaaag 60
 ctggggaagg aagctcaggc aggagcctcc ccgacaccac agcggcacia gcagcagcta 120
 aagcaccgca ctttgctctg ctaacctttt acttaaatga ggttttgcca aatccacatc 180
 tggaaaccgca tcacacccat ttgcaaggat gtttgttctt tgatgaaact gcactctctac 240
 tgcacatgan ggcttttcatt gtaggacaag aggagagttc gtttattttt gtaactgttt 300
 tacatgttcc gattanttaa tcggnagctt atgtcatttg ctatgcctgt tgtcttctaa 360
 tctctcctta ctaaaacatt acttcaaatt tnaattgacc cttgtttata atttatttaa 420
 cgggatttgn gtgtc 435

<210> 593
 <211> 633
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(633)
 <223> n = A,T,C or G

<400> 593

ctgttttagtc agataattgt gtccgaattg attangaaaa taatagacca gccataaagc	60
agcataaaat attatgaaac tattccagaa gttcagtaat atctttggga cctgctcata	120
gcccaggttt tgtgaatact tttgtagtta aaaaaaattt ttactttacc agggcattgc	180
aattcttttc catcagtga tttcattcta cagacttttc agagcatctc ataatcagtc	240
aacaaatcta tttcaaagtgt gtttggttact aagcaacggg tgctaagagc ttctgtaatt	300
aagatgaaag ttccaaggta acaatgcccc aacacagcac cattttcacc attttctgat	360
aatgcaggag taggatggct aaaagtgaag gaagaatcta ctctatggaa agcatggcac	420
ctgaaatttc tgaagatatt ggctgtcctc tagcttataat gagagagagt gtttgtgctt	480
tactaatcaa ccagtcattt ttttcttggt tggctgaaat gtacattcca gacatgaaca	540
ggtagagtat gtgttggggg caggtttata ctgcatgggt gtgctgagac agggccacgt	600
ggtgatgtaa atgatgctgn ctgacacgtg cag	633

<210> 594
 <211> 501
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(501)
 <223> n = A,T,C or G

<400> 594

cctttacaag atgctggtac cttgatcttg gacngggcag gctccaagat ggaaagaaaag	60
tgagcatctg ctttttaggg attatccagt ctatactact ctgttctagc cacacaaaac	120
aggtaagac agaaattggg accaagagtg ggggtgttact acagcaaata cctgaaaatg	180
tagaagaggc tttgaaatgt ggtaattgga agaagctggg agaatttgga ggagtaggct	240
agaaaatgtc tgtattttca tgaatggagc attaagaata attccgggtga ggccataggg	300
aaagtctaaa acttttcaga aattatgtaa gcgattgtga ttagtagggt ggtagaaata	360
tagacagtaa aagcaattct gatgtgggtt cagaggaaaa tgaaaaatat tagaaactga	420
aggaaggggc atccttgcta taaactggca aagaacttgg ctgaaatgtc tccatgtcca	480
agagatttat ggcagaaatg t	501

<210> 595
 <211> 383
 <212> DNA
 <213> Homo sapien

<400> 595

ctggtcacca tcatcccttt aatcaactca cacctgttta aagagtgttt ctgatttgac	60
cttcatccct tagtttactg gcgttaaaaa aagtctcagc aattttcatt atttctcgtg	120
ggtctcatta tcaaaccctt acttatttcg gcatatttcc tctgggcttc ttctagtttc	180
tgccttacia gcaatgctgt tctgtaaatt tattgaaacc tctggaacat ttcaccttta	240

gagatggagg atggaaggat tggtagaccaga agaggggctaa gatacgtttt ctgtcttgag	300
ctgaaagcac agtctactct ccttcgtttt gtcgatgaga aagttgaggc cagaggggag	360
gtgacatggt tagagtcacc cag	383

<210> 596
 <211> 266
 <212> DNA
 <213> Homo sapien

<400> 596	
ccatggctag gtttatagat agttgggtgg ttggggtaaa tgagtgaggc aggagtccga	60
ggagggttagt tgtggcaata aaaatgatta aggatactag tataagagat cagggttcgtc	120
cttttagtggt gtgtatggct atcattttgtt ttgagggttag ttgattagt cattgttggg	180
tggttaattag tgggttggtg atgagatatt tggagggtggg gatcaataga gggggaaata	240
gaatgatcag tactgcggcg ggtagg	266

<210> 597
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (383)
 <223> n = A,T,C or G

<400> 597	
ctggtcacca tcatcccttt aatcaactca cacengttta aagagtgttt ctgatttgac	60
cttcatccct tagtttactg gcgttaaaaa aagtctcagc aattttcatt atttctcgtg	120
gggtctcatta tcaaaccttt acttatttctg gcatatttcc tctgggcttc ttctagtttc	180
tgcccttacia gcaatgctgt tctgtaaaatt tattgaaacc tctggaacat ttcaccttta	240
gagatggagg atggaaggat tggtagaccaga agaggggctaa gatacgtttt ctgtcttgag	300
ctgaaagcac agtctactct ccttcgtttt gtcgatgaga aagttgaggc cagaggggag	360
gtgacatggt tagagtcacc cag	383

<210> 598
 <211> 266
 <212> DNA
 <213> Homo sapien

<400> 598	
ccatggctag gtttatagat agttgggtgg ttgggtgtaaa tgagtgaggc aggagtccga	60
ggagggttagt tgtggcaata aaaatgatta aggatactag tataagagat cagggttcgtc	120
cttttagtggt gtgtatggct atcattttgtt ttgagggttag ttgattagt cattgttggg	180
tggttaattag tgggttggtg atgagatatt tggagggtggg gatcaataga gggggaaata	240
gaatgatcag tactgcggcg ggtagg	266

<210> 599
 <211> 294
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (294)

<223> n = A,T,C or G

<400> 599

ccaattgatt	tgatggtaag	ggagggatcg	ttgaccacgt	ctgttatgta	aaggatgcgt	60
aggggatggga	gggcgatgag	gactaggatg	atggcgggca	ggatagttca	gacggtttct	120
atttcctgag	cgtctgagat	gttagtatta	gttagttttg	ttgtgagtgt	taggaaaagg	180
gcatacagga	ctaggaagca	nataaggaaa	atgactatga	gggcgtgatc	atgaaagggtg	240
ataagctctt	ctatgatagg	ggaagtagcg	tcttgtagac	ctacttgccg	tgca	294

<210> 600

<211> 213

<212> DNA

<213> Homo sapien

<400> 600

agatattggg	ctgttaattg	tcagttcagt	gttttaattct	gacgcaggct	tatgcggagg	60
agaatgtttt	catgttactt	atactaaca	tagttcttct	ataggggtgat	agattgggtcc	120
aattgggtgt	gaggagttca	gttatatgtt	tgggattttt	taggtagtgg	gtgttgagct	180
tgaacgcttt	cttaattggg	ggctgccttt	agg			213

<210> 601

<211> 471

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(471)

<223> n = A,T,C or G

<400> 601

ncctactatg	gggtgttaaat	tttttactct	ctctacaagg	ttttttccta	gtgtccaaag	60
agctgttcct	ctttggacta	acagttaaat	ttacaagggg	atttagaggg	ttctgtgggc	120
aaatttaaag	ttgaactaag	attctatctt	ggacaaccag	ctatcaccag	gctcggtagg	180
tttgctgcct	ctacctataa	atcttcccac	tattttgcta	catagacggg	tgtgctcttt	240
tagctgttct	taggtagctc	gtctggtttc	gggggtctta	gctttggctc	tccttgcaaa	300
gttatttcta	gttaattcat	tatgcagaag	gtataggggt	tagtccttgc	tatattatgc	360
ttgggtataa	tttttcatct	ttcccttgcg	gtactatatc	tattgcgcca	ggtttcaatt	420
tctatcgctt	atactttatt	tgggtaaatg	gtttggctaa	ggttgtctgg	t	471

<210> 602

<211> 482

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(482)

<223> n = A,T,C or G

<400> 602

tgagcataca	gcaataaaaa	taacataatt	tntatgtgta	caatatttat	ggaatacgtt	60
actggaacag	ataaataatt	tagttaataa	catgacaaag	aacagaaatt	gtatacacta	120
tacagcatag	taatagaata	atgaatgatt	aaagttatta	atattaggta	gaaaatgaag	180
ggatatcttg	agagcagaac	tcaaggaagc	aagcaatttg	ccttatgagg	aaagagttac	240

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ctgtggataa aggagaaact gaaaaattta caagtcaaga ctttttgagc aaaaacaaaa 300
atatgactat gagtcaccaa ttcagtacag tgaaaaaaaaa gttgaagaga tatcttggaa 360
gtaaaccatg ttgtggaaga gcagggtttt gataatcatg ggattattct gaatgaattt 420
taaatgcat aggaatatat gagataattt caccagagaa taatatgatc atgtttgcat 480
tt 482

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<210> 603
<211> 372
<212> DNA
<213> Homo sapien

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<400> 603
gttccaacct tcatttctga aactgttcta gagcactttg tctttctcgt agttcataac 60
ttacccttc agtctagaat tagaattaca ttatctgtt tactacttta ctagactgta 120
agtcctaga agataaggac tagggagttc atctctgtat tccaccagaa ggtacagtga 180
ctcataacta gagtcttttag atgaaactta ctgagttgaa taacttaata tatttctgtt 240
ttcattccca agggaggcca tgtctggaga tagaccttga atttaataaa ttttaggcac 300
tataccattt cagtggagaa aattgttggg aaatttgggg ggatggatat ataaggggga 360
ggaagtcact gg 372

```

```

<210> 604
<211> 468
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1) ... (468)
<223> n = A,T,C or G

```

```

<400> 604
gcngttttga gtgagtttct taatcctgag ttctggnttg attgcactgt ggtctgagag 60
atagtttgtt ataatttctg ttcttttaca cttactgagg agagctttac ttccaagtat 120
gtggtcgatt ttggaatagg tgtggtgtcg tgctgaaaag aatgtatatt ctggtgattt 180
ggggtggaga gttctgtana tgtctattag gtccgcttgg tgcagagttg agttcaattc 240
ctggatagcc ttgttaactt tctgtctcgt tgatctgtct aatgttgaca gtggggtggg 300
aaagtctccc attattattg tgtgggagtc taagtctctt tgtaggtcac taaggacttg 360
ctttatgaat ctgggtgctc ctgcattggg tgcacatata tttaggacag cnagctcttc 420
ttgttgaatt gatcccttta ccattatgta atggccttgn ctcttttg 468

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<210> 605
<211> 288
<212> DNA
<213> Homo sapien

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<400> 605
ccaattgatt tgatggtaag ggaggggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaaagca gataaggaaa atgactatga gggcgtgatc atgaaagggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac ctacttgc 288

```

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<210> 606
<211> 572
<212> DNA

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<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(572)

<223> n = A,T,C or G

<400> 606

gaatnaaatg aatgaaatag aaaatataat tgagagcttc aacaacagac tataccaaat	60
ggaggaaaaa atttctgaac ttgaagatag atcttttgaa ataacacaag cagtggcaaa	120
aatgaattaa aaagaataag gaaagcctaa aggatttatg agatatcatt aagcaagcaa	180
atattcatac tatgggcatt ccagatggaa aaaagaaggg taaagggtgag gaaatcatat	240
ttaatgaaat aatagcagaa aatttccgga gtcttgggag agagatgagc atttaggtcc	300
agggagctca aagaacccca aacagattca acccaaacag gtcctctctg gagcccaaca	360
tagtcaaatt gtaataagta aaagacaaag aattccaana agcattcaag agaaaagagt	420
caagtcataa ataagggaat ctccattagg ctaacagcag atatctcagc agaaagctta	480
cangccanga gagaatggga tgatatattc aaagtacttg aaagcagggg tnggggaaac	540
cctgctagct aaaaatatta tacccttgca aa	572

<210> 607

<211> 178

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(178)

<223> n = A,T,C or G

<400> 607

ctcggggtaa tctcccagca agaggtcagg tcttgntgt gcgtcccagg gtgtcagtga	60
aattggctgc tcccctgacc cagggcacct tcatgcgtct tcacagcagg actactgtga	120
ccaaggccag acctttcatc tttcaaaaga ctttgactaa aaatgcttta aaaaagca	178

<210> 608

<211> 416

<212> DNA

<213> Homo sapien

<400> 608

cctgtctttg aatggatgaa ataggttaat aaagaacatc actgttttaa aactagaaca	60
ctgaaaaatt ctaggaaagc ttattttccc ttatatattt atgggtacttt caacacttaa	120
taacactatt tcaattaagt tttctcctag agtttatagt atatcagtac attcctttct	180
gtggatgcaa taatatagaa tcttattcca aatcttactg gcaggttctc ttaaattctt	240
caacggctgt catagtgatt aaccaaatt agttatgatt tctgcctatc tgtgtgagaa	300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa	360
atgatgacag tcattttata tcaccttcaa ttaccaaca gcttttaata gtctgg	416

<210> 609

<211> 648

<212> DNA

<213> Homo sapien

<400> 609

ctgatctctc agcagaaact cttcaaacca gaagagagtg ggggcccaata ttcaacattc	60
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ttaaagaaaa taattttcaa cccagaattt catatccagc caaactaacc ttcacaagtg      120
aaggagaaat aaaatccttt acagacaagc aaatgctgag agattttatc accaccaggc      180
ctaccctaaa agagttcctg aaggaagcac taaacatgga aaggaacaac cagtaccatc      240
gaggctagga agaaaccgca tcaactaagg agcaaaataa ccagctaaca tcataatgac      300
aggatcagat tcacacataa cgatattaac tttaaatgta aatggactaa atgctccaat      360
taaaagacac agactggcaa attggataaa gagtcaagac ccatacaggt gctgtattca      420
ggaaacccat ctcaccgtgc agagacacac ataggctcaa aataaagggc tggaggaaga      480
tctaccaagc aaatggaaaa caaaaaaagg caggggttgc aatcctagtc tctgataaaa      540
cagactttta accaacaag atcagaagag acaaagaagg ccattacata atggtaaagg      600
gatcaattca acaagaagag ctaactatcc taaatatata ttgcaccc                      648

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<210> 610

<211> 310

<212> DNA

<213> Homo sapien

<400> 610

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ccagctcttc tctgtcacat tctattttct gacttctgcc tggctttcag tttctgcccc      60
accttggttt tttccagct tgaacctaat agaactccag agtttggggg gagggccagc      120
cctttgtttt ctgctcttga agcatattca cacataaaaa gttgtattct cttacacaaa      180
ctgttttgag gctcttaccg tagtcgaagg tatcttagat cttccttagt gatctcatta      240
agaatatccg aaagtgtata accctcttca acaatctgaa acaaagatca gatccttaag      300
agctgagcag                                     310

```

<210> 611

<211> 254

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (254)

<223> n = A,T,C or G

<400> 611

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ctgttttttac atctaaagca atagactaga actgaattnt cttctacata gtaaaatcac      60
aattgtggaa ttacaggaat tctggtgata ttaaggtgaa acaacaaaac acaaaaggcc      120
ctattttaac agttgatgtg acagtaagtt ttaatagaac ctgtaacttc attttggaaa      180
tgcttctcca ccaaataagg cctttttccc ctatttaagg agccagatgg attgaaagat      240
gtggaaatag gcag                                     254

```

<210> 612

<211> 225

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (225)

<223> n = A,T,C or G

<400> 612

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ctgactatat catgtcacca tcatagccaa tacaacattn ttgccatact tcctaaaaac      60
cttttcgcac acactgatca tgctacttat cagcactttc taacatcctg accaaacaga      120
caccacacc tccttatagag tacactgtga gagaataaca tggacttgat atggcatcac      180

```

acttggtttta aagcaaaaaa aaaagaaaaa gaaaagaaaa aaaaa 225

<210> 613
 <211> 471
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(471)
 <223> n = A,T,C or G

<400> 613
 ccatcagact tcttggtgct ctggctatat tcaatgtgaa gtaaaaaata tcccaagtct 60
 tacaccaaaa tagaggctct gacttagaag tatgctttta gctttctttt taaataagac 120
 attctggaag aaaaaaaaaa aaaaaggaaa gaaaatcaag tttgaaacac agttaacact 180
 tattttggca agaaagcaac caaaatctaa aaagcataaa ctatgngtcc aaatgnaaaa 240
 ggnattacag aacaaactgc aagaggggaa aattaaagcc nactgaacg aaaaaatata 300
 gtatgtctaa cattttggaa ttgnaattta aaccctaagg gcaaaagctg aaaaatcatg 360
 cttanacctn ggncgngacc acnctaaggc cgaattccan cacactggcg gncgttacta 420
 gtggatccna nctcgggtacc aagcttggcg taatcctngg catagctgtt t 471

<210> 614
 <211> 421
 <212> DNA
 <213> Homo sapien

<400> 614
 gttatttttt agaatggctc tcccatcttg agtatgtgtg atgtttcctc atgtatgaat 60
 gaagcatata catctttgtc agaagtatcc cagaagcaat tctgtactct cctcattatg 120
 ttctattggg tgggccatgg tttttgattt gtctcattac tgatgatggg tacttttatt 180
 atttgataaa ggttggtatat aacttatcta ttatggcata atacattagc taaaaccttg 240
 gcggtgtaaa acagcagata cttacgtttc tcataggaat ggctctattg agtacctctg 300
 tctcaaggct tctcaagagt ttgtagctac cttgttggct ggggttgcg tctgacctaa 360
 aggcttagtt aggggggtgg agaaatcttc catatgttct ttgctacgtg gacctcacag 420
 g 421

<210> 615
 <211> 242
 <212> DNA
 <213> Homo sapien

<400> 615
 cctcctatth attctagcca cctctagcct agccgtttac tcaatcctct gatcaggatg 60
 agcatcaaac tcaaaactac cctgatcg cgactgcga gcagtagccc aaacaatctc 120
 atatgaagtc accctagcca tcattctact atcaacatta ctaataagt gctcctttta 180
 cctctccacc cttatcacia cacaagaaca cctctgatta ctctgccaat catgaccctt 240
 gg 242

<210> 616
 <211> 392
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(392)
 <223> n = A,T,C or G

<400> 616
 cctaatttgt agattgtgaa agcagctttt agtttaactt atttacagac cccttataat 60
 taccatgttt tttttttnt tcctaaatct nttgggttcag cttgngaata ttacgtgccc 120
 gtaaagtngg gatgttgaat nggcccttnt ttgttctggc agngagtcaa gngtccanca 180
 ttttttcata agngtttttt aaaatngttc tccancattt tatggctcct ccctcccatg 240
 tcctcaaacc cagcaaaagc gtanaggcan aattanagga ccnccccggg cggccgntaa 300
 gggcnaattc cagcncactg gcggccgtta ctagnnggatc cnagctcggn nccaagctng 360
 gcgtaatcat ggnccatagct gtttctgtg an 392

<210> 617
 <211> 215
 <212> DNA
 <213> Homo sapien

<400> 617
 cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
 gctgttcctc tttggactac cagttaaatt tacaagggga tttagagggt tctgtgggca 120
 aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
 ttgtcgctc tacctataaa tcttcccact atttt 215

<210> 618
 <211> 433
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(433)
 <223> n = A,T,C or G

<400> 618
 cttttgtntg cctgttttgt ggactggctg gctctgttag aactctgtcc aaaaagtgca 60
 tggaatataa cttgtaaagc ttcccacaat tgacaatata tatgcatgtg tttaaaccac 120
 atccagaaaag cttaaacaat agagctgcat aatagtattt attaaagaat cacaactgta 180
 aacatgagaa taacttaagg attctagttt agttttttgt aattgcaaat tatatttttg 240
 ctgctgatat attagaataa tttttaaatg tcactctgaa atagaaatat gtattttaag 300
 cactcacgca aaggtaaatg aacacgtttt aaatgtgtgt gttgctaatt ttttcataa 360
 gaattgtaaa cattgaactg aacaaattac ccataatgga tttggttaat gacttatgag 420
 caagctgggtt tgg 433

<210> 619
 <211> 259
 <212> DNA
 <213> Homo sapien

<400> 619
 ctgcagtgtc cttttttata tcatgctagt gttgagacat acttgactaa cttgggaaca 60
 gttcgatata ttgacaaccg tcaacttaag aaaatcaaca gcttttggcc ccagcgcca 120
 agtgaacttt tcatggagtg cagaatctca aatggacaaa atactttgtc tttttaata 180
 ctgaaaattt aattattagt actatgactg aaagattctt catggctaaa aagctctgca 240
 tcaaactcaa ttcaggagg 259

<210> 620
 <211> 393
 <212> DNA
 <213> Homo sapien

<400> 620
 ccaccaaagc cacacggaga ttctgtcagg cgctgagaca ccacagcctt ttcaatctta 60
 gggaaagaaa tcaagtcata taaattaata tcaacaggta aggtcattga gcaattgtct 120
 ttcaactgtc taagacttta tcaactaaga tcataaacac agaagcaggt cataaaaaata 180
 gcttttctta aggttttagga gaattttagg gggcacttac ttgataatct gaattttcta 240
 gtcagaagtt taaataccac cttttaaaaa cataaaattt aatttgtaac aagttattaa 300
 caaagcagta ttgtcgaaag ttttaagctt tctcccaata atttaattac attaatataa 360
 tttttaccat tctaattggtt acaaagtaac cag 393

<210> 621
 <211> 563
 <212> DNA
 <213> Homo sapien

<400> 621
 ctgacaatga taaaattatc tctatatggg caaacgcgtg ctctttgtcg aagaagaaag 60
 cttcagcttc atgttccagg tgagttaatt aggcaatgta tgaatgctaa tatctctttc 120
 acatattttg cttaagatct gtcttaggac tctcgtctgg cccatatggt tttccaaggg 180
 cagaagggcc tctttttgat gagaggcagt tttcagtaac tcttaaagtg ataacagcaa 240
 aggagaggag agagaagagt aagacaaatc gaaacattct tcaattgctt cttggccttt 300
 tggctaagct caagctcaaa acaggtcttc aaggagaaaa tacatcacaa agaaaaggat 360
 gttttatttc ttaccttgct ctagaaaaat ttccataaac tctattggct taattctgta 420
 aacttgacca atatcagagt gcttcctacc aaggagggtg gctgatgagc gtgaccatgg 480
 tacatcctag aagaatgtgt gatgaagaag ctttcaccgt gtaaaagagt tgaaaattat 540
 tcaaggagac attatggtct tgg 563

<210> 622
 <211> 505
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(505)
 <223> n = A,T,C or G

<400> 622
 tcttaagtgt gtttaataga taaagtaaac tttcctagtc aagggttaga tttttattat 60
 ctcttggtgt cgcactttct acttttcaac tttgaacttc aaaaaaacat tactttgctt 120
 atcctttgta ctttgatcag gttgtttaga attgtagatc aaaccattct ttgatcattt 180
 tattgtttaa atgnttagt ccatttataa tttttatagc caactctcgg ttattttctgt 240
 cttttgagat tgcaattcag aagctgtatg tcgaagtaat ttatgagttg acttttatac 300
 ttaggcttct ttaaatacta atagtcaaga attctagagc atctaataaa aaattaactt 360
 tcagatcatt gggaatctgt cctcatttaa atatgtgtaa atgcatttcc acagcaaatt 420
 gcttcatgcc ctttgnctat aaggaaatta ttcctttagt ctaatacatt tttcattttg 480
 cagnccaaat ctttttttag aaagg 505

<210> 623
 <211> 489

<212> DNA

<213> Homo sapien

<400> 623

cctactatgg	gtgttaaatt	ttttactctc	tctacaaggt	tttttcctag	tgtccaaaga	60
gctgttcctc	tttggactaa	cagttaaatt	tacaagggga	tttagagggg	tctgtgggca	120
aatttaaagt	tgaactaaga	ttctatcttg	gacaaccagc	tatcaccagg	ctcggtaggt	180
ttgtcgccct	tacctataaa	tcttcccact	attttgctac	atagacgggt	gtgctctttt	240
agctgttctt	aggtagctcg	tctggtttcg	ggggtcttag	ctttggctct	ccttgcaaag	300
ttattttctag	ttaattcatt	atgcagaagg	tataggggtt	agtccttgct	atattatgct	360
tggttataat	ttttcatctt	tcccttgccg	tactatatct	attgcgccag	gtttcaattt	420
ctatcgctat	actttatttg	ggtaaaggtt	ttggctaagg	ttgtctggta	gtaaggtgga	480
gtgggtttg						489

<210> 624

<211> 233

<212> DNA

<213> Homo sapien

<400> 624

gttggggaac	agctaaatag	gttgttggtt	atttggttaa	aaaatagtag	ggggatgatg	60
ctaataatta	ggctgtgggt	ggttgtgttg	attcaaatta	tgtgtttttt	ggagagtcac	120
gtcagtggta	gtaatataat	tgttgggacg	attagtttta	gcattggagt	aggtttaggt	180
tatgtacgta	gtctaggcca	tatgtgttgg	agattgagac	tagtagggct	agg	233

<210> 625

<211> 459

<212> DNA

<213> Homo sapien

<400> 625

ttcgagaaca	tttttaataa	ataatgtgac	aaaattactt	ttctgattat	tggattttca	60
gtatgcaaaa	ttatggctaa	aaataagggg	cttcttacat	gaacataatg	aaaacattaa	120
tcacatggat	tgttccctta	gtactgcacg	ccttttctat	ggaacttttt	caaattatct	180
aaatgaacaa	gtttggtttt	ggtgaacacc	agcctttttt	tttgtggttc	agttttgttt	240
ggctttgtct	tccactgggg	tcagacctga	tacttatcta	tctatgaata	aatgtacatt	300
tttttcttca	aatagcacca	attataaaat	caatgatatt	cataaaatga	caaaaaagga	360
tcatagaaat	ctactagtca	gagggcatca	tttgtcaatt	gaaagcaagt	aatgcctcta	420
ttagagattt	taaggaaatc	ttgtagggtt	cgacattgg			459

<210> 626

<211> 458

<212> DNA

<213> Homo sapien

<400> 626

cctgatgatt	gttttaaaca	gtagaaaggg	ttcagctaag	aactacagtc	cactctcagc	60
cctgtcatgt	actataggac	aagtcttcat	tcacaacaaa	tggatagcaa	caccaatctc	120
gtaacactgg	gaaaactgca	tacaatattt	agaaggaaca	ctaatacagc	agaatctgca	180
cacaacggag	tcaaagatct	gaggccaaat	cctactacac	tttacgactt	tgagttggtc	240
acttttctga	accttagctt	ctccatcagt	gtaaaactga	tgtaaaataa	tataaagcta	300
tatgaaagct	gatgtgattt	acttgtgaaa	tagtatgtgc	aaaaggactt	tgtaaaatgt	360
aaagcactat	gctggttatt	gtgatatctg	agatattttt	aaagttgcaa	ttcaattcaa	420
caagcattca	tttagagtca	tgtgcaaggc	actgtgct			458

<210> 627
 <211> 393
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(393)
 <223> n = A,T,C or G

<400> 627
 ccattngaac gcactcagga ggtgggtttgt tctggatgca gaaaccagag atctagtttc 60
 tatccacaca gacgggaatg aacagctctc tgtgatgcgc tactcaatag atggtacctt 120
 cctggctgta ggatctcatg acaactttat ttacctctat gtagtctctg aaaatggaag 180
 aaaatatagc agatatggaa ggtgcactgg acattccagc tacatcacac accttgactg 240
 gtccccagac aacaagtata taatgtctaa ctcgaggagac tatgaaatat tgtactggga 300
 cattccaaat ggctgcaaac taatcaggaa tcgatcggat tgtaaggaca tttgattgga 360
 ccgacatata cctgtgggct aggacttcca gga 393

<210> 628
 <211> 233
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(233)
 <223> n = A,T,C or G

<400> 628
 ctggatttat aaaatagttg aatgacaaaa gaagnntggt ttgacagtaa aaaaaagaca 60
 ttatggacaa aatatgcaaa atgtgcaaa aaaaaataaa tttgcattag aaaggtgggc 120
 atttgatctc tgagccctgt gccatgtaac attgccatgt tctttcactg ttgtttgaat 180
 gttgtacccc ancccttgac tctggactta aggcaagcta tgactgggctt tgg 233

<210> 629
 <211> 450
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(450)
 <223> n = A,T,C or G

<400> 629
 ccnggacaat ntaggcagga gaaggaaata aagggtattc aattaggaaa agaggaagtc 60
 aaattgtccc tgtttgcaga tgacatgatt gtatatctag aaaaccccat tgcctcagcc 120
 caaaatctcc ttaagctgat aagcaactcc agcaaagtcg caggatacaa aatcaatgga 180
 cacaaatcac aaacattctt atacaccaat aacagacaaa cagaggccaa atcacgagtn 240
 gaactctatt ccaattgctt tcaagaaaat taaaatacct agggatccaa cttacaaggg 300
 acatgaagga cctcttcaag gagaaactac aaaccactgc tcaatgaaat aaaagaggat 360
 acaaagaaat ggaagaacat tccatgctca ttggtagctt gatgggggatg gcattgaatc 420
 tataaattac cttgggcagt atggacctca 450

<210> 630
 <211> 486
 <212> DNA
 <213> Homo sapien

<400> 630
 cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
 gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggg tctgtgggca 120
 aatttaaagt tgaactaaga ttctatcttg gacaaccagc taccaccagg ctcggtaggt 180
 ttgtcgctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
 agctgttctt aggtagctcg tctggtttcg ggggtcttag ctttggtctt ccttgcaaag 300
 ttattttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
 tggttataat ttttcatctt tcccttgagg tactatatct attgcgccag gtttcaattt 420
 ctatcgctta tactttattt gggtaaattg tttggctaag gttgtctggt agtaaggtgg 480
 agtggg 486

<210> 631
 <211> 211
 <212> DNA
 <213> Homo sapien

<400> 631
 tttacataaa tattatacta gcatttacca tctcacttct aggaatacta gtatatcgct 60
 cacacctcat atcctcccta ctatgcctag aaggaataat actatcactg ttcattatag 120
 ctactctcat aacctcaac acccactccc tcttagccaa tattgtgctt attgccatac 180
 tagtctttgc cgctgcgat gcagcggtag g 211

<210> 632
 <211> 293
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(293)
 <223> n = A,T,C or G

<400> 632
 cagcgcaagt aggtctacaa gacgctactt ccctatcat agaagagctt atcacctttc 60
 atgatcacgc cctcatagtc atttttcctt atctgcttcc tagtcttgta tgcccttttc 120
 ctaacactca caacaaaact aactaatact aacatctcag acgctcagga aatagaaacc 180
 gtctgaacta ngctgcccgc catcatccta gtcctcctcg cctcccctc cctacgcctc 240
 ctttacataa cagacgaggt cnacgatccc tcccttacca tcaaatcaat tgg 293

<210> 633
 <211> 263
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(263)
 <223> n = A,T,C or G

<400> 633

nggtctgcag	tgtccctttt	tatatcatgc	tagtggtgag	acatacttga	ctaacttggg	60
aacagttcga	tatattgaca	accgtcaact	taagaaaatc	aacagctttt	ggccccagcg	120
tccaagtga	cttttcatgg	agtgcagaat	ctcaaagga	caaaatactt	tgtcttttta	180
aatactgaaa	attnaattat	tagtactatg	actgaaagat	tcttcatggc	taaaaagctc	240
tgcatcaaac	tcaattcagg	agg				263

<210> 634

<211> 491

<212> DNA

<213> Homo sapien

<400> 634

cctactatgg	gtgttaaatt	ttttactctc	tctacaaggt	tttttcctag	tgtccaaaga	60
gctgttcctc	tttggactaa	cagttaaatt	tgcaagggga	tttagagggg	tctgtgggca	120
aatttaaagt	tgaactaaga	ttctatcttg	gacaaccagc	tatcaccagg	ctcggtaggt	180
ttgtcgctc	tacctataaa	tcttccact	attttgctac	atagacgggt	gtgctctttt	240
agctgttctt	aggtagctcg	tctggtttcg	ggggtcttag	ctttggctct	ccttgcaaag	300
ttatttctag	ttaattcatt	atgcagaagg	tataggggtt	agtccttgct	atattatgct	360
tggttataat	ttttcatctt	tcccttgccg	tactatatct	attgcgccag	gtttcaattt	420
ctatcgctta	tactttattt	gggtaaatgg	tttggctaag	gttgtctggt	agtaagggtg	480
agtgggtttg	g					491

<210> 635

<211> 270

<212> DNA

<213> Homo sapien

<400> 635

ccaattgatt	tgatggtaag	ggagggatcg	ttgacctcgt	ctgttatgta	aaggatgcgt	60
agggatggga	gggcgatgag	gactaggatg	atggcgggca	ggatagttca	gacggtttct	120
atttcctgag	cgtctgagat	gttagtatta	gttagttttg	ttgtgagtgt	taggaaaagg	180
gcatacagga	ctaggaagca	gataaggaaa	atgactatga	gggcgtgatc	atgaaagggtg	240
ataagctctt	ctatgatagg	ggaagtagcg				270

<210> 636

<211> 383

<212> DNA

<213> Homo sapien

<400> 636

cctactatgg	gtgttaaatt	ttttactctc	tctacaaggt	tttttcctag	tgtccaaaga	60
gctgttcctc	tttggactaa	cagttaaatt	tacaagggga	tttagagggg	tctgtgggca	120
aatttaaagt	tgaactaaga	ttctatcttg	gacaaccagc	tatcaccagg	ctcggtaggt	180
ttgtcgctc	tacctataaa	tcttccact	attttgctac	atagacgggt	gtgctctttt	240
agctgttctt	aggtagctcg	tctggtttcg	ggggtcttag	ctttggctct	ccttgcaaag	300
ttatttctag	ttaattcatt	atgcagaagg	tataggggtt	agtccttgct	atattatgct	360
tggttataat	ttttcatctt	tcc				383

<210> 637

<211> 537

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (537)

<223> n = A,T,C or G

<400> 637

ttttaatcct	ggggtatata	ggcagnactt	taaattgcaa	agtcttccgg	gcctatttttc	60
ctctacattt	ttgtaattaa	ctctgggggc	ttacttgttt	tggcagtact	gaaatcaaag	120
gagctgggtc	ttctttttct	ccaattatct	tcatatgaaa	gcacctacaa	ttagcctggt	180
agtcctattc	agatacatca	aatatcagtg	aatgcctttac	tattcgcaca	tttaagcatc	240
tttgttttac	ataaaattag	agtatgaaaa	ccagtggtca	attttttatc	ttgttgagct	300
tgtaaaatgc	cagcaattta	aaactaggac	ttttccccc	ataagccaag	gaggtagaat	360
tactaataca	agggttaaag	aaggtagatt	ttgttttcaa	tatttgggta	atattagaaa	420
gattcttccc	acagggaaga	actagcaagt	gtcccaattt	tttccaaacg	ttggggaggg	480
gaaaattcac	tgtatcatga	aaccctaagg	gtttgngtgc	acttcctgct	tttttagg	537

<210> 638

<211> 445

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (445)

<223> n = A,T,C or G

<400> 638

ccagcagaac	acagnagtga	tttgggtccc	tttggtcccc	agtgggggtat	ctatccttgt	60
gcagggcaca	agcctacatg	gtggctctgg	tcatatcatt	agaaaataga	cagaaatggg	120
ctgcacacca	gaatgaatga	attgaattga	aaggaggagg	tgatgggtgga	aaaaaaaaaca	180
agtcaattca	tttagactgg	tagaaccaga	accactgtgt	agtacatcca	aacgggttaa	240
attccctgga	agatgttaca	taatcctatc	atgggtgttta	tttatggaaa	tctatttttaa	300
aaatttttatg	taatactgca	cagtctgttt	gcatgatgcc	ttgtacgtag	tagcaactca	360
gtaaatactt	tttgaatgaa	ctagtatagt	attttaatta	gctagtcttc	gtgtactggg	420
acaaaagaac	agtgtcatct	tacag				445

<210> 639

<211> 584

<212> DNA

<213> Homo sapien

<400> 639

gcttgagtat	tctatagtgt	cacctaaata	gcttggcgta	atcatgggtca	tagctgtttc	60
ctgtgtgaaa	ttgttatccg	ctcacaattc	cacacaacat	acgagccgga	agcataaagt	120
gtaaaagcctg	gggtgcctaa	tgagtgaagt	aactcacatt	aattgcgttg	cgctcactgc	180
ccgctttcca	gtcgggaaac	ctgtcgtgcc	agctgcatta	atgaatcggc	caacgcgcgg	240
ggagaggcgg	tttgcgattt	gggcgctctt	ccgcttcttc	gctcactgac	tcgctgcgct	300
cggctcgttcg	gctgcggcga	gcggtatcag	ctcactcaaa	ggcggtaata	cggttatcca	360
cagaatcagg	ggataacgca	ggaaagaaca	tgtgagcaaa	aggccagcaa	aaggccagga	420
accgtaaaaa	ggccgcgttg	ctggcgtttt	tccataggct	ccgccccctt	gacgagcatc	480
acaaaaaatcg	acgctcaagt	caagagggtg	cgaaaccgca	caggactata	aagataccag	540
gcggtttcccc	ctggaagctc	cctcgtgcgc	tctcctgttc	cgac		584

<210> 640

<211> 404

<212> DNA

<213> Homo sapien

<400> 640
 ccataggaac gcactcaggc aggtgggttg ttctggatgc agaaaccaga gatctagttt 60
 ctatccacac agacgggaat gaacagctct ctgtgatgcg ctactcaata gatggtacct 120
 tcctggctgt aggatctcat gacaacttta ttacctcta tgtagtctct gaaaatggaa 180
 gaaaatatag gagatatgga aggtgcactg gacattccag ctacatcaca caccttgact 240
 ggtccccaga caacaagtat ataatgtcta actcgggaga ctatgaaata ttgtactggg 300
 acattccaaa tggctgcaaa ctaatcagga atcgatcgga ttgtaaggac attgattgga 360
 cgacatatat ctgtgtgcta ggatttcaag tatttggtgt ctgg 404

<210> 641
 <211> 138
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(138)
 <223> n = A,T,C or G

<400> 641
 ctgtgacagg aacattacct gaagtgcagg gtgggttacct gcacaaagtc ccatttccaa 60
 aaatttctgt gtaattcacc agaaattttg gatggaataa ttagaaaaaa aaaaagagggt 120
 taaaacntgt aactcaaa 138

<210> 642
 <211> 381
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(381)
 <223> n = A,T,C or G

<400> 642
 ctgtagggtg aatttttacc cagaaaagat aggccctaga agcctcattt cttttctcca 60
 tggaaaagga cagccctctg ctgcagcgtt caacttgtgt gtttactgac agagtgaact 120
 acagaaatag cttttcttcc taaaggggat tgttctacat tttgaagtta ttttttaata 180
 aaattgaatt atgttgtgta ttgtgcttcc taataggaaa tgcattattg gactgttttt 240
 gtaacatcct gtttattgca aatagctagt atcgttcaaa aactgtataa aatacttttg 300
 tacatattag caatgtctaa tttgtatata cttcagttaa atttccctaa aacttgaaag 360
 gggaccttgt anaaattaaa a 381

<210> 643
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 643
 ccttcctaaa aaatagtggg gagctggagg ctacttccgc cttcttagcg tctggtcaga 60
 gagctgatgg atatcccatt tgggtccgac aagatgacat agatttgcaa aaagatgatg 120
 aggataccag agaggcattg gtcaaaaaat ttgggtgctca gaatgtagct cggaggattg 180
 aatttcgaaa gaaataattg gcaagataat gagaaaagaa aaaagtcatg gtaggtgagg 240
 tgggttaaaaa aaattgtgac caatgaactt tagagagttc ttgcattgga actggcactt 300

```

attttctgac catcgctgct gttgctctgt gagtcctaga tttttgtagc caagcagagt      360
tgtagagggg gataaaaaga aaagaaattg gatgtattta cag                          403

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<210> 644
<211> 688
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1) ... (688)
<223> n = A,T,C or G

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<400> 644
cctattttatt tgttttggcc ctggatcttt cctaatacaca attatatattc tttattttttg      60
ccttttgagca gtttcattta tctttgtggg cagggaagat taaatatgaa attcagtcca      120
gtcatttttgc tactgggttag ctttagtttg aggcaagtaa aaatttttga ttaaaattag      180
tttcttaaaaa ttatgccctt gctttaccaa ataatcaaat tggctaaaaa ataagggtat      240
gtaacttttgc attttgaaga acaaaccaat aatttttcat gagccctact cgatcttctt      300
taaagaagac cttcctaaga gacaattagg gatgagtttg attaatggga aatagctcta      360
ggtttagatta ttttaaattc catacaccaa gtgatttaac cacagtggca gtggcagctt      420
ctgaaccgtc aagtatgaac atcacttaaa aattaaaaga tgcttaataa taaactctta      480
attttcatta agccaatctg taattcagaa gaaaagcata tgtctgccat gggactattg      540
cagtgcgtct ccacagtggt taacacagga gagatatgtt attttatgtg tatgtcttag      600
tttgggatat gtggtagtaa gaacatgtca agagtgcctt tcttcaaacc tgnacagctca      660
actgangaaa gacaggtact tccattgc                                          688

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<210> 645
<211> 484
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1) ... (484)
<223> n = A,T,C or G

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<400> 645
ccaaatgtgt ctccagccca cacttccagg tggcagagcg agctctctat tactggaata      60
atgaatacat catgagttta atcagtgaca acgcagcgaa gattctgccc atcatgtttc      120
cttccttgta ccgcaactca aagaccattt ggaacaagac aatacatggc ttgatataca      180
acgccctgaa gctcttcatg gagatgaacc aaaagctatt tgatgactgt acacaacagt      240
tcaaagcaga gaaactaaaa gagaagctaa aaatgaaaga acgggaagaa gcatgggtta      300
aaatagaaaa tctagccaaa gccaatcccc aggtactaaa aaagagaata acatgaaaac      360
gcccaggggtt acttgaatgt ttttataaga taggaatata tgtcttcacc atgggggggg      420
gtctcggatt tcactaacgt tgtatatgaa aatgggtgcn ataaaaagta cttttaaact      480
ttgt                                          484

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<210> 646
<211> 447
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature

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<222> (1)...(447)

<223> n = A,T,C or G

<400> 646

gggtcgcggtt gaacaacttg gttcaagatg gtgggggcat ttttagagcg gcaataattg	60
aaaaaaaaagg cgaactctgc cttggagagg tagatgataa gaaataaaaa ggtgtttata	120
actattttgt attataaagt gggccttaga gataggaaga agaatgatgg attccttttg	180
gatcaatcag aaaggaaaca cgaaagaaaa gtcaggaagg tagagagaga aaaagggagg	240
gaaggagaaa gaatgggaat aaaataagga ggtaagagat actatttttg ctgagcaacc	300
agtgtgtttc aggatgatac aaagaaaaat atagaataga aataagtgca ggcttggaat	360
cagctacaaa tcctaaagat ggggtgtgtg tggatgtgtg tgtgtgtgtg tgnacaccat	420
tgtgtgtttg taaaatgtgt atgtccc	447

<210> 647

<211> 388

<212> DNA

<213> Homo sapien

<400> 647

gaagggtgata taaaatgact gtcatcattt ggagtgtgca gtacagttac ttcattgttcc	60
tcagggttag aacaatttcc cctgcaagtt ctcacacaga taggcagaaa tcataactaa	120
ttttggttaa tcaactatggc agccgttgaa gaatttaaga gaacctgcca gtaagatttg	180
gaataagatt ctatattatt gcatccacag aaaagaatgt actgatatac tataaactct	240
aggagaaaaac ttaattgaaa tagtgttatt aagtgttgaa agtaccataa aaatataagg	300
gaaaataagc tttcctagaa tttttcagtg ttctagtttt taaacagtga tgttttttat	360
taacctatct catccattca aagacagg	388

<210> 648

<211> 632

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(632)

<223> n = A,T,C or G

<400> 648

cctggctggg cntttgacct gcgnttttaa atnactcaca gaggggtggga caggaggaag	60
agtgaaggaa aagggtcaaac ctgttttaag ggcaacctgc ctttgttctg aattggtctt	120
aagaacatta ccagctccag gtttaaattg ttcagtttca tgcagtcca atagctgatc	180
attgttgaga tgaggacaaa atcctttgtc ctcactagt tgcctttacat ttttgaaaag	240
tattatTTTT gtccaagtgc ttatcaacta aaccttgtgt taggtaagaa tggaatttat	300
taagtgaatc agtgtgaccc ttcttgtcat aagattatct taaagtctga gccaaaatat	360
gcttcaaaaag aagaggactt tattgttcat tgtagtccat acattcaaag catctgaact	420
gtagtttcta tagcaagcca attacatcca taagtggaga aggaaataga tagatgtcaa	480
agnatgattg gtggagggag caagggtgaa gataatctgg gggtgaaatt ttctagtnt	540
cattccgtac attttttagtt agacatcaga tttgaaatat taatgttacc tcctcaatgg	600
ggtggtatca gacctgcccg ggcggnccgnn tc	632

<210> 649

<211> 300

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(300)
 <223> n = A,T,C or G

<400> 649
 nggtgaagat agaanaaata taagcgaaat tggataaaat agcactgaaa aaatgaggaa 60
 attattggta accaatttat tttaaaagcc catcaattta atttctggtg gtgcagaagt 120
 tagaaggtaa agcttgagaa gatgagggtg ttacgtaga ccagaaccaa tttagaagaa 180
 tacttgaagc tagaagggga agttggttaa aaatcacatc aaaaagctac taaaaggact 240
 ggtgtaattt aaaaaaaact aaggcagaag gctttggaag agttagaaga atttgaagg 300

<210> 650
 <211> 498
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(498)
 <223> n = A,T,C or G

<400> 650
 ngtnctgnta aacagaaggg tacaangccc ttctggcttt aagcagtcac aggaatgtga 60
 cagacattcc tcttagggag cgctctctcc tagggtttcc tcatctgtct cacactgagt 120
 ggatgtaatg ctattttaat cctgctgtgg cccccaatac tagtacttgt ccataccttc 180
 ttgcattttt agcgtctgct ctgtgggggt gttaggccct ggcactccca ggaactagt 240
 ctaaagctgc atctntctct cccctctagg gatcgataaa gtttactgct agaaagtctc 300
 cactgcggta tgctgacatc tgccctgaac cttcacctta cagcattaca ggctttaatc 360
 agattctgct ggaaagacac aggctgatcc acgtgacctc ttctgccttc actgggctgg 420
 ggtgatcctt ggtgcctttg tttccacaag gccttttctc gcccctgccc ttgccaaaga 480
 catttaatca gcacacag 498

<210> 651
 <211> 654
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(654)
 <223> n = A,T,C or G

<400> 651
 ctgaggggtcc ccagggtttct aaagctctca ggacgagaaa gtaggtccca agataaggag 60
 cctaaagggc ttttttcttt ctgtgtattc cttcttggcc tccaacatgg gtacagtcac 120
 aagagcatgt aacagagaag aaggactana cctaccattt tctggataaa gaattggaaa 180
 gaggatccac aggttaaccaa aaagtaccag ggaaatggca gagaaggaaa acctcaggag 240
 accaacctca taagtggat ttattagngc ctgggctcaa atccaaattg tacatgaata 300
 tgtctgggtcc tagatagggt accgaagact ttgaaagtga attttggtat atcattgccc 360
 agattccaga ctggntattg tgtgacacaa catacaggat atatctgaat agtgctcaga 420
 agagtttgaa aatgcaaatg atattaaaat aaagatgaaa aagagaaagc tggtcagaac 480
 ttgtggacat aaccttctg gatctgtngc ctgattaaaa aatagttgat attctcgaat 540
 gaattaaaac aagatttaga gactgagcat ggtagctnat tcttgtaatc caacnctttg 600
 ggaggggcaag gcaanagaat tgcttgccgc caggagtttt gagaccagct tggg 654

211

<210> 652
 <211> 293
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(293)
 <223> n = A,T,C or G

<400> 652
 ngctctgttgc actgaggtga ctaaggatac attttgagga agtagctcca agaacatttc 60
 cattttcact gtgccttcac atacatctaa tggaaatgaa cagcaccctt catccatcca 120
 cggaagcgat taagaaaagg gtgggatgga aaaattaacc caacaatatt agatcaatac 180
 gtagtattta agngtccata atgtgccagg ctgaagatgc acgggaaaac cacactagcc 240
 ggtctgtcaa gggcttgaga ataccataaa caagaaaaca gacgaaccaa ttt 293

<210> 653
 <211> 294
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(294)
 <223> n = A,T,C or G

<400> 653
 ngtcaccac tgcagcccta catacagttg aaaaaaaatt ccattctgtt aacatttgtt 60
 ttataagttt tcacgcaata cacaaaaaac ccctctgcac ttcttgtaaa gaacaaaaaa 120
 gatacacaa agttaagcgt aaagatcaca ggcaatagca ttcaaacatg gatgtgggta 180
 gagaaaggag tacctggcat gagtacctgc ttagtttgac tgaatccttg atttttaatt 240
 tggcttttca tgggcccgtc acaacaccaa cgctgtgtga ggtatggtag tcag 294

<210> 654
 <211> 250
 <212> DNA
 <213> Homo sapien

<400> 654
 ctgtccttga acaagtatca atgtgtttat gaaaggaaga tctaaatcag acaggagttg 60
 gtctacatag tagtaatcca ttgttggaat ggaacccttg ctatagtagt gacaaagtga 120
 aaggaaattt aggaggcata ggccatttca ggcagcataa gtaatctcct gtcctttggc 180
 agaagctcct ttagattggg atagattcca aataaagaat ctagaaatag gagaagattt 240
 aattatgagg 250

<210> 655
 <211> 494
 <212> DNA
 <213> Homo sapien

<400> 655
 ccattataat ttataaacac cattaccctt taaattctac cgattataag cagcgtaaaa 60
 gtaactatat aaagcaaaca tcgcaaagga actctgcagg agctcttaat tccttttatgt 120

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agctatcata aaattcactt tcctgaagac atttactctc attcacttcc aaactccaaa 180
cctttttctg gtagcaccac ttttgttttt aatagaaaga tgagttcata tctgtacatc 240
tctccaaagc tctaaggaat gagaaaagga tcctagtata ttgaaattac tgatgtttaa 300
tacctctgcc ttttacttaa aagccattta atatttttaa agtcaaaact tgacatacag 360
gtatttataa ggaatctcca tgactctgaa ggaatgaaat tgatgtaggt agctttggct 420
atgtaaagac atagtagagg acaattactt aaagaagagt tttcttttga ggatttgtag 480
atttgactaa gcag 494

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<210> 656
<211> 477
<212> DNA
<213> Homo sapien

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<400> 656
cgcgttactg tacatatgtc tagcaggaga caactggaaa tactaaacaa atactggaat 60
tcacattaca gacagacgaa accaacaatg atgccacaca taacttcctt tgtagtttca 120
cagagggcct atttgtggtt gctcaggtgg ggtcatacat tgcttgcaga aatggcctga 180
tcatagctct atgaaacaat gaattcggaa tgaaatctta ccatgacacc tctctgtagg 240
aaagaaatgt tgcttcacgt gtgctaagtt gagataataa tatttcacat atttatatac 300
agagaatcac tctcaaattt aacccaagat aagcaatagg atttgggggt gacttgtaga 360
catttctaac aacacttttc ttttttctag aggtcactct caaacactga tatatcacta 420
tagtttgagt gtagggttgc agtaatcaaa gggtgttatt gcaaaagagc caggcag 477

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<210> 657
<211> 576
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(576)
<223> n = A,T,C or G

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<400> 657
cctctacctg tanatcacta tttttctaaa gacaatttgg tgttttgaag ataaatgtca 60
ttagtctatg ataatagcat cataggacaa ttagccattt tagacttgac catattttct 120
cttttttagca tatagccatc ttgatattta ggtgggagac tactccaatg gagcaacagt 180
ttcattttac atgattggat ttagaaattt acaaatttta aactcataag aattctaaat 240
aatgtgaaaa tggaaacatt tgaccacag tctagcagca taaatacatt tataaaatac 300
ttcattgttg atcttaggtc attgatttaa aacagaattt ggtgactatg ggcagggtgga 360
ggggggccagt gaggaaggta taaaagagaa atctttatga attgtgttca gattgatttt 420
gtataaacat aatatattca tggttgtatc tcttatttat aataccaaac taacatgaag 480
gtggtccaag ggaaggatca atattttaaa taacatattt gcttaaaata tcatacagtg 540
gctgcttcat aaaaaatctt ataaactttt attacc 576

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<210> 658
<211> 344
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(344)
<223> n = A,T,C or G

```

<400> 658
 cctgaaaaga aagntgctct tatggactct tgcattgttaa gactatgtct tcacatcatg 60
 gtgcaaata catgtaccca atgactccgg ctttgacaca acaccttacc atcatcatgc 120
 catgatggct tccacaaagc attaaacctg gtaaccagag attactggtg gctccagcgt 180
 tgtagatgt tcatgaaatg tgaccacctc tcaatcacct ttgagggcta aagagtagca 240
 catcaaaagg actccaaaat cccataccca actcttaaga gatttgtcct ggtacttcag 300
 aaagaatttt catgagtgtt ctttaattggc tggaaaagca ccag 344

<210> 659
 <211> 230
 <212> DNA
 <213> Homo sapien

<400> 659
 ctgctttccc tgctaaacag ttccagagca aaagcagcaa aaagaaaata tgggagggat 60
 atgggcaacg tatactcgaa cgtacgcaga gaagagagta cggtagctc taatatttct 120
 cattgaactt ggtggtatgt gccttccttg catataaggc catagtgtt ttttgggagc 180
 gctagaatat ccattccactt gacagtgacc acaaaatagg ctgtttccag 230

<210> 660
 <211> 80
 <212> DNA
 <213> Homo sapien

<400> 660
 ctggtccttg ttaaactcga tcaccacttt ggagagatcg actggaggct cctgggtgtt 60
 ctgagggggc tgggggacag 80

<210> 661
 <211> 535
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(535)
 <223> n = A,T,C or G

<400> 661
 ctgaaccata tctgattaac tctttggtct ctgttattgg aacaaaaccg acgctatgcc 60
 tgcagccgcc agactgcaac caaaaacaca gtttggggtc agaagacatt aaaaatcaca 120
 ataaaatagg atgaatgttc taagtcacgc aactgaatca aggcaccttt ttttttcaaa 180
 agcaaaaagt tgtttaacaa tattccagaa tagtagatac ttcaaaaacc agattacagt 240
 atatatcatt ttgctgcaca ttttagtcta ttttctgtat acatagtcac acattcttta 300
 ccctctccca acttatacat gctttatccc cccagtcatg tgctatgtag gtataaaaaa 360
 ataaagtgtg atctaaacaa gtgattttaa aaaaaaaact aacgaatgcc ncnatnataa 420
 cncatgaactt gtttcctnt tgaaggacat tggaaatgtt accgaggttn ntttacctng 480
 gccgcaaccn cncatangggc naattccagc nactggggg ccgttactag gggat 535

<210> 662
 <211> 257
 <212> DNA
 <213> Homo sapien

<400> 662

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cctgactaaa gcacatatca cactccctac acttccatgt tttctctccc atgtggaccc      60
tctgatgcac atcaagattc aagcgctgtg tgtagccctt cccacagtcc tcacatttgt      120
atggcttttc tacactgtga actttttctt gcactttaga gaatgaattc tgtacaatgt      180
tcttcccatg ctgctcacat ttgagagggtg tttctctgct gtggcgtctc tgatgggtca      240
gacgagttga ggaccag                                     257

```

```

<210> 663
<211> 516
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(516)
<223> n = A,T,C or G

```

```

<400> 663
ccaattatag gtattttatt ttttaaagat tagagngttc ttgaagctct ttctatttct      60
ttgtcaatga actaaacatt ggcaaatatg tagggtttcc cacataagaa cattattaac      120
atcaaaatag aaagctgggtg gtagaaataa tgattgggaa cacagagtct ctactcagcg      180
ttctacttct gccataccat aactttgtga tctcacgaaa tatctctcca tgttctcatc      240
cctatgtata gttctgtcat ttttcaataa gagctttttg ctttaattatg aagtactagt      300
tactataaacc attattttga gcttcatgta aatcaagaac acatggactc cacttgcaaa      360
acattgaaaa tgtagttagg gattgggggc aaaaagcaac attttaaaat gtgtaaagac      420
aatgagtaag caacaaaagt tccaattttt taggcgaaag ttgcatatgt caggaaaagg      480
caggattaag taatagagaa tttgaatgat aactgg                                     516

```

```

<210> 664
<211> 212
<212> DNA
<213> Homo sapien

```

```

<400> 664
gtccgaggag gttagtgtgt gcaataaaaa tgattaagga tactagtata agagatcagg      60
ttcgtccttt agtggtgtgt atggctatca tttgttttga ggtagtttg attagtcatt      120
gttggttggg aattagtcgg ttgttgatga gatatttgga ggtggggatc aatagagggg      180
gaaatagaat gatcagtact gcggcgggta gg                                     212

```

```

<210> 665
<211> 408
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(408)
<223> n = A,T,C or G

```

```

<400> 665
atccaggggt ncccggtngc tgcngggaaa cctccagcct tgttcttcaa accactcagc      60
tcatgtgttt tgcgctgact agtactgaat aatacaacca ctcttattta atgttagtat      120
tattttattt acaactcagt gtctaacagc ttgatatgca ggtccttgca tcctacattt      180
cttttaggaag ttacccattt gtaactttta aaacaggaaa aatatcagtt ggcaaatgca      240
atcttttttt tttttaagct aaaggggggn naacngnaan naaaatnttt ntgangtngg      300
gtctataaag acccttgang ggatntgtta aaagnngcat naanggggga ttctcntttt      360

```

gcaaaaaaat ntaannatca atttatanan ctttattttt nactttnt

408

<210> 666

<211> 635

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(635)

<223> n = A,T,C or G

<400> 666

ctgaagnaca	agggtcaggc	aaaaataaga	tcacaatcac	caatgaccag	aatcgcttga	60
cacctgaaga	aatcgaaagg	atgggttaatg	atgctgagaa	gtttgctgag	gaagacaaaa	120
agctcaagga	gcgcattgat	actagaaatg	agttggaaag	ctatgcctat	tctctaaaga	180
atcagattgg	agataaagaa	aagctggggag	gtaaaccttc	ctctgaagat	aaggagacca	240
tggaaaaagc	tgtagaagaa	aagattgaat	ggctggaaag	ccaccaagat	gctgacattg	300
aagacttcaa	agctaagaag	aaggaactgg	aagaaattgt	tcaaccaatt	atcagcaaac	360
tctatggaag	tgcaggccct	cccccaactg	gtgaagagga	tacagcagaa	aaagatgagt	420
tgtagacact	gatctgctag	tgctgtaata	ttgtaaatac	tggaactcagg	aacttttggt	480
aggaaaaaat	tgaaagaact	tanctctcga	atgtcattgg	aatcttcacc	tcacagtggg	540
gttgaaactg	ctatagccta	agcnggctgt	ttactgnttt	ncattagcag	gtgctcacca	600
tgtctttggg	gtgggngggg	ggagaaagaa	agaan			635

<210> 667

<211> 388

<212> DNA

<213> Homo sapien

<400> 667

gaagggtgata	taaaatgact	gtcatcattt	ggagtgtgca	gtacagttac	ttcatgttcc	60
tcagggtttag	aacaatttcc	cctgtaagtt	ctcacacaga	taggcagaaa	tcataactaa	120
ttttgggttaa	tcactatggc	agccgttgaa	gaatttaaga	gaacctgcca	gtaagatttg	180
gaataagatt	ctatattatt	gcattccacag	aaaagaatgt	actgatatac	tataaactct	240
aggagaaaaac	ttaattgaaa	tagtgttatt	aagtgttgaa	agtaccataa	aaatataagg	300
gaaaataagc	tttcctagaa	tttttcagtg	ttctagtttt	taaacagtga	tgttttttat	360
taacctattt	catccattca	aagacagg				388

<210> 668

<211> 498

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(498)

<223> n = A,T,C or G

<400> 668

tgatcttaac	aaaattcgta	gcagtggaaac	cttgaaatgc	atgtggctag	atttatgcta	60
aaatgattct	cagttagcat	tttagtaaca	cttcaaagggt	ttttttttgt	ttgttttcta	120
gacttaataa	aagcttagga	ttaattagaa	gaagcaatct	agttaaattt	cccatttgta	180
ttttattttc	ttgaatactt	ttttcatagt	tattcgttta	aaaagattta	aaaatcattg	240
cactttgggc	agaaaaataa	ttaatataatc	ttatgaatgt	ttgattccct	tccttgctat	300

ttttattcag tagatTTTTg tttggcatca tgttgaagca ccgaaagata aatgattttt	360
aaaaggctat agagtccaaa ggaatgttct tttaacacaa ttcttccttt aaaaatntct	420
gaggaatttg ttttcgcctt actttttttt cttctgtcac aatgctaagn ggtatccgag	480
gtntttaata tgagattt	498

<210> 669

<211> 622

<212> DNA

<213> Homo sapien

<400> 669

ccttagccaa agaatgcagt ggagccttcc cccttcaact gcattgtgaa tgaataccaa	60
ttaacagcat aaaaattaat agtcccatat cagatctgga aggggtttct ggggctgtct	120
gatgtcccta tctgttgta gtgaacacaa tagcagaaaa ttctttctgg gtccatctgc	180
tataaagtct tggtaaaaca gcattactat gaagaggatg aactcaccta ctttcagatg	240
gaggaaaagt gaaaaggact taggcttttag tcctccatga cttttcttaa gcactaccta	300
cctgtaataa gctgagtgc aaaggatgcc gaagaaaatc tgcaccaga agctgttaga	360
aagcactgca gagaacaggg tatgaagaaa ataaagagtt ctttaataaac ctttaagatt	420
ctttgttcaa ggtaaccttg ccaaaagggc agagttagtg gcaaagagtt gcttttaatc	480
tagctctaca ctgcatttga aaataaaaatt tgcccatttt gaatatattg ttataatta	540
aatgtgcttt ttacactgca ggtcaatata aaaactgggt agtaaatttc cagcgagcat	600
ttatgttcat ttgctcacag ca	622

<210> 670

<211> 477

<212> DNA

<213> Homo sapien

<400> 670

ttgggccctc tagatgcatg ctcgagcggc cgccagtgtg atggatatct gcagaattcg	60
cccttgccgc ccgggcaggt gatggatgag gagcaaaaac ttatacga tgatgaagat	120
gatatctaca aggctaataa cattgcctat gaagatgtgg tcgggggaga agactggaac	180
ccagtagagg agaaaataga gagtcaaacc caggaagagg tgagagacag caaagagaat	240
atagaaaaaa atgaacaaat caacgatgag atgaaacgct cagggcagct tggcatccag	300
gaagaagatc ttcggaaaga gagtaaagac caactctcag atgatgtctc caaagtaatt	360
gcctatttga aaagggttagt aaatgctgca ggaagtggga gggtacagaa tgggcaaaat	420
ggggaaaggg ccaccaggct ttttgagaaa cctcttgatt ctcatctat ttatcag	477

<210> 671

<211> 127

<212> DNA

<213> Homo sapien

<400> 671

gtgtgtgtgt ctacttgggc gtgtttaacg tgtgcgtttg tgtctgcgtg tgcattgtgc	60
tgtgtgtgcg cgtgtatttc agtttgggtt gccggatccc atatgattgc gtgcctgtgt	120
acctgag	127

<210> 672

<211> 400

<212> DNA

<213> Homo sapien

<400> 672

gggtctgcac agctatgtta acagcatcct tataccagga gtaggaggaa agacacgact	60
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ggaaaagcaa	ttcaagctgg	tcacacagtg	taatgcaaaa	tatgtggaat	gtttcagtg	120
tcagaaagag	tgtaacaaa	aaaagaacag	aaactcttca	gttgtgccat	ctgagcgtgc	180
tcgagtgggt	cttgacccat	tgccctggaat	gaaaggaaca	gattacatta	atgcttctta	240
tatcatgggc	tattatagga	gcaatgaatt	tattataact	cagcatcctc	tgccacatac	300
tacgaaagat	ttctggcgaa	tgatttggga	tcataacgca	cagatcattg	tcatgctgcc	360
agacaaccag	agcttggcag	aagatgagtt	tgtgtactgg			400

<210> 673

<211> 600

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(600)

<223> n = A,T,C or G

<400> 673

ctggcgttgc	tcattagtga	atgtatgaca	gcaggatgtg	aggggatgcc	caggagtcag	60
tgtagcatt	gtcatctgag	atcactgcta	ttaatatcat	ccattaattt	attagtgagc	120
ttcactatat	gcagactggg	agataaggag	aaaatctgtc	acattctctc	tagctaataca	180
gatcagctac	caattaatga	gattctgaat	gaaatatcaa	tatgtgtttt	tctaatttgg	240
acctaggaca	gagctgttgc	ttgtcataga	gaaaaacaat	aatgcttaaa	catagcacat	300
tataattaaa	gcagggtttct	cacatacttt	tcattttatc	ctttggataa	ttttgtgagg	360
aacgcaggac	accaacttcc	ctttcataga	tacaatcccc	atgctattga	tgaaagtgtt	420
tttgaatgaa	gccatacaac	aaataactga	tcaaagtggc	attacaccaa	aatttcttag	480
taggactcct	gcatagaatg	tttagataga	cgtgaaaagt	ttgttcanga	ggaccagcaa	540
gagagaaact	gggttccttg	ggagggtttc	ggtgctacat	ttataccctn	catcagagtn	600

<210> 674

<211> 140

<212> DNA

<213> Homo sapien

<400> 674

ggtgggttgg	gtaaagtgt	gaggcaggag	tccgaggagg	ttagttgtgg	caataaaaaat	60
gattaaggat	actagtataa	gagatcagg	tcgtccttta	gtgttggtga	tggttatcat	120
ttgttttgag	gttagtttga					140

<210> 675

<211> 245

<212> DNA

<213> Homo sapien

<400> 675

gttgggttgg	tggtgtaaat	gagtgaggca	ggagtccgag	gaggttagtt	gtggcaataa	60
aaatgattaa	ggatactagt	ataagagatc	aggttcgtcc	tttagtggtg	tgtatggcta	120
tcatttggtt	tgaggttagt	ttgattagtc	attgttgggt	ggtaattagt	cggttgttga	180
tgagatattt	ggagggtggg	atcaatagag	ggggaaatag	aatgatcagt	actgcggcgg	240
gtagg						245

<210> 676

<211> 621

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(621)

<223> n = A,T,C or G

<400> 676

ctgtccccag	ggnaaatagt	ngaattcaac	taagatctgt	taataagatg	tcagaataac	60
taataatttt	attaggaaaa	aatcatgttt	taaatttcaa	aatgacactt	atttgtcaag	120
taatatgatk	ttggaaaatt	ttaaagaaaa	ataatcctac	ttataaacta	cttttttata	180
attgtttttca	gaaaaaaagt	ttacagtctt	aaggaaaata	ttcaggtcta	tcatatgggt	240
tgacagatttt	tttaaaaagt	attttttggt	aggtcttctt	ttagaaaaaa	attaatctca	300
aggggtttttt	gtaccactat	aatctccta	acttactcag	aattactgtg	tatttactta	360
atttcttatt	atgtgcctta	ttatgtgctt	aagatacaat	aggtagaggt	ttaatctaaa	420
tatcttgaaa	gctatattgt	gggcttggt	agcattttgt	tttttctttc	tctgttttgg	480
taaggatttta	aaattttttt	cattgcaatt	ttaagtgggt	ttcaataagt	aatagttttt	540
atcaaatttt	tggtgcttgg	tgacagagcg	gcgtggggaa	gggtgaatgg	ttttgggaat	600
aattcagtcg	acacctgggg	g				621

<210> 677

<211> 210

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(210)

<223> n = A,T,C or G

<400> 677

tttacataaan	atattatcag	cattttaccat	ctcacttcta	ggaataactag	tatatcgctc	60
acacctcata	tcttccctac	tatgcctaga	aggaataata	ctatcactgt	tcattatagc	120
tactctcata	accctcaaca	cccactccct	cttagccaat	attgtgccta	ttgccatact	180
agtctttgcc	gcctgcgaag	cagcggtagg				210

<210> 678

<211> 383

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 678

gtaggagtca	ggtagttagg	gttaacgagg	gtggtaagga	tggggggaat	tagggaagtc	60
aggggttaggg	tggttatagt	agtgtncatg	gttattagga	aaatgagtag	atatttgann	120
aactgattaa	tggttgggnn	tgagttnta	tatcacagcc	anaattntat	gatgnaccat	180
gtancgaaca	atgctacagg	gatgaatatt	atggagaagt	antctanttt	gaagcttagg	240
gagagctggg	ttgtttgggt	tgnggctcan	tgtcagttcc	anataataac	ttcttggtct	300
aggcacatga	atattgttgt	ggggaanaga	ctgataataa	aggtggatgc	gacaatggat	360
tttacataat	gggggtatna	gtt				383

<210> 679

<211> 371
 <212> DNA
 <213> Homo sapien

<400> 679
 aaaatgaaaa tattgacaag agtttcagat agaaaaatgaa aaacaagcta agacaagtat 60
 tggagaagta tagaagatag aaaaatataa agccaaaaat tggataaaat agcactgaaa 120
 aaatgaggaa attattggta accaatttat tttaaaagcc catcaattta atttctggtg 180
 gtgcagaagt tagaaggtaa agcttgagaa gatgagggtg tttacgtaga ccagaaccaa 240
 tttagaagaa tacttgaagc tagaagggga agttgggttaa aaatcacatc aaaaagctac 300
 taaaaggact ggtgtaattt aaaaaaaact aaggcagaag gcttttggaag gagttagaag 360
 aatttgggaag g 371

<210> 680
 <211> 176
 <212> DNA
 <213> Homo sapien

<400> 680
 cctaggattg tggggggcaat gaatgaagcg aacagatttt cgttcatttt gggtctcagg 60
 gtttggttata atttttttatt tttatgggct ttggtgaggg aggtaagtgg tagtttgtgt 120
 ttaatatattt tagttgggtg atgaggaata gtgtaaggag tatgggggta attatg 176

<210> 681
 <211> 152
 <212> DNA
 <213> Homo sapien

<400> 681
 ctggagatgg atatgagact agtcaagatg tgaatgctaa ttggagagaa atataatttt 60
 aggaagatgc acattgatgt ggggttttga tgtgtctgat ttgactact caagctctgt 120
 ttacagaaga aaattgaatg gcgagggtgt gg 152

<210> 682
 <211> 141
 <212> DNA
 <213> Homo sapien

<400> 682
 ccagtgcctg cttgccgtgg tttagtattt ggggtgttaga aataaaaaact caggtctatt 60
 tcttaccagt cagtaacaat ttttagagaa tgtacttggg atataatata tggacttcag 120
 gaactttgtt ggggtggggg g 141

<210> 683
 <211> 308
 <212> DNA
 <213> Homo sapien

<400> 683
 ccagcaatgg tacagagtga ggggtgttctg ctaatgactt cagagaagta ttttaagaaaa 60
 acatagaaaa acgtgtgcgg agtttgccag aaatagatgg cttgagcaaa gagacagtgt 120
 tgagctcatg gatagccaaa tatgatgcca tttacagagg tgaagaggac ttgtgcaaac 180
 agccaaatag aatggcccta agtgcagtgt ctgaacttat tctgagcaag gaacaactct 240
 atgaaatgtt tcagcagatt ctgggtatca aaaaactaga acaccagctc ctttataatg 300
 catgtcag 308

<210> 684
 <211> 277
 <212> DNA
 <213> Homo sapien

<400> 684
 tgggtattagg attaggatgt gtgaagtata gtacggatga gaagggtggg gaacagctaa 60
 atagggtgtt gttgatttgg ttaaaaaata gtaggggat gatgctaata attaggctgt 120
 ggggtggttgt gttgattcaa attatgtgtt ttttggagag tcatgtcagt ggtagtaata 180
 taattgttgg gacgattagt tttagcattg gagtaggttt aggttatgta cgtagtctag 240
 gccatatgtg ttggagattg agactagtag ggctagg 277

<210> 685
 <211> 457
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(457)
 <223> n = A,T,C or G

<400> 685
 ctgtggcgtt cctacttct cccaaacctc gcaactccct cccaggacag tcagtgccaa 60
 agaaaacaggt cgctgaaaac taaaatgtcc acatccctaa ctggcaaccc acatcaaccc 120
 caaaagggtt aagaatcatc taagatattt cagatgctct atgaagaaat tcactttaac 180
 acttataact gtaagacttt gcatacatta caacagtgc ttagtgatac aagttgtaaa 240
 atacgtttcc attcctttgg attttgcata tgatggtttt gcacagtcac ctgcaggtag 300
 attgagcaag ctttttgtgt ttgttttttt aaacatgcat tcaactagat atgattcaga 360
 atagattaat actccctttt tatcactaca gttagctaaa aaattgccag gcagtcacaa 420
 aaacagaatt tgctttaaga ccaaccaca gagtcag 457

<210> 686
 <211> 234
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(234)
 <223> n = A,T,C or G

<400> 686
 ntggatttat aaaatagttg caatgacaaa agaagtatgt tttgacagta aaaaaaagac 60
 attatggaca aaatatgcaa aatgtgcaaa gaaaaaataa atttgcatta gaaagggtggg 120
 catttgatct ctgagccctg tgccatgtaa cattgccatg ttctttcact gttgtttgaa 180
 tgttgtagcc cagcccttga ctctggactt aaggcaagct atgactggct ttgg 234

<210> 687
 <211> 315
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(315)
 <223> n = A,T,C or G

<400> 687
 nngtctgtga aaaactcttt ggatgattct gccaaaaagg tacttctgga aaaatacaaa 60
 tatgtggaga attttgggtct aattgatggc cgcctcacca tctgtacaat ctctgtttc 120
 ttgccatag tggctttgat ttgggattat atgcaccctt ttccagagtc caaaccggt 180
 ttggctttgn gtgtcatatc ctattttgtg atgatgggga ttctgaccat ttataacctca 240
 tataaggaga agagcatctt tctcgtggcc cacaggaaag atcctacagg aatggatcct 300
 gatgatattt ggcag 315

<210> 688
 <211> 522
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(522)
 <223> n = A,T,C or G

<400> 688
 ctgaattaga ggaggagaaa agaagccatt nnggagtact ttaattgttt agatgtgaga 60
 ggctgaatgt ttgggttaag atgttagttg tcagaatcat gagaaaagg ttttaagcaag 120
 gggcatttct aattctaaaa ataacaacta ctgttattta ttgagcacta tctttttgtt 180
 ggggtactgtc taaagtactt gatttatttt ttaaaacctt acaaaaaact tacaaggtag 240
 gtactgaaag attcagtaat ttgttcaaag tcacacagca aataagcaac agactctgga 300
 tttgaaccag gcaatcctag agcctgtact gttagtaatt atacttttagc acctgtcaag 360
 aattcctgtt gagtgtcaag aagcaanca caagttagga tttaaagcaa acatgattga 420
 agaatactgt ggtgtggttg acagtgtgc ctaagtctgt tttcagagtg aaaaatgaca 480
 aattagattt taagtatggt ttggagataa tatcaggaca gt 522

<210> 689
 <211> 158
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(158)
 <223> n = A,T,C or G

<400> 689
 tctcaactta ntntnatacc cacaccacc caanaacagg gtttgtagg nattgtttgc 60
 attaataaat taaagctcca tagggctctc tcgtcttgc gtgtcatgcc cgcctcttca 120
 cgggcaggtc aatttctact gttaaaagta agagacag 158

<210> 690
 <211> 300
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature

<222> (1) ... (300)

<223> n = A,T,C or G

<400> 690

tagaactcgt	attttttaa	ttctattctc	tanccttttc	cactacatta	tgacacaaga	60
ccctgcagaa	agtcgtctgg	aaaatatcag	accatctctt	acttgtccca	tccaatctta	120
catcgaatta	tatgcaccct	taaaaagtta	tttgaggatt	taaaaaactc	tattagccca	180
aattacctga	aataaaactcc	tggcttggtc	ccctaattgt	tataaaaaat	tgattgaaaa	240
tattcatttt	aaaaatgaag	ntcttgaatt	tatttaaatt	actgtcttgc	agtgagttgg	300

<210> 691

<211> 305

<212> DNA

<213> Homo sapien

<400> 691

ctgttcagaa	agctcattgg	acctgggttt	gaaaataaaa	caaagttaaa	accctgggag	60
gagttattgt	gcagtgtgga	gtactcaggc	tttcttataa	agaaaaaaaa	agttatctgg	120
taccaaagtg	tgcaacctac	agaccctcag	gtactgccct	gtgacttctc	tgtatgacat	180
cacaaggctg	ccaagtgcct	gtttttctag	aactaggagt	tggtgagggt	tggctagtag	240
tgaaaccatg	cataggattg	gtttactaaa	ttaaaacctt	attacgtacg	tcctccaaaa	300
gacag						305

<210> 692

<211> 582

<212> DNA

<213> Homo sapien

<400> 692

caggaaatgg	ataaccattt	taactgtatt	ttttgcagcc	cgtaccttct	tggaataaca	60
attgtctaac	tttttatatt	tggctctggc	gttggtggtg	gcaaaaactcc	gtacattgct	120
attttgccac	actgcaacac	cttacagatg	tgggaagatg	gaaatttgct	atcaattatg	180
actaccctaa	ctcctcagag	gatttatatt	atcgaattgg	aagaactgct	cgcagtagca	240
aaacaggcac	agcatacact	ttctttacac	ctaataacat	aaagcagggt	agcgacctta	300
tctctgtgct	tcgtgaagct	aatcaagcaa	ttaatcccaa	gttgcttcag	ttggtcgaag	360
acagagggtg	aggtaaggat	gactgatagg	aatgtttggt	agttacgagt	cacatcggtg	420
tctacaaaac	cattttaaag	gtattggagg	gtgagtaaaa	ccttgaatgt	gaaaacttaa	480
gctgaaaaat	tgtaaaaaac	tttcacgcct	accatgaata	gatctgtttc	tttctgtcca	540
caatgatatt	tgatcatagc	ataattgac	aatttgcaat	tg		582

<210> 693

<211> 275

<212> DNA

<213> Homo sapien

<400> 693

ccaattgatt	tgatggtaag	ggagggatcg	ttgacctcgt	ctgttatgta	aaggatgcgt	60
agggatggga	gggcgatgag	gactaggatg	atggcgggca	ggatagttca	gacgggttct	120
atctcctgag	cgtctgagat	gttagtatta	gttagttttg	ttgtgagtgt	taggaaaagg	180
gcatacagga	ctaggaagca	gataaggaaa	atgactatga	gggcgtgatc	atgaaagggt	240
ataagctctt	ctatgatagg	ggaagtagcg	tcttg			275

<210> 694

<211> 397

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(397)

<223> n = A,T,C or G

<400> 694

nggtctgcat	ttttattgcg	atctgcagat	gaactggaaa	atctcatttt	acaacagaaac	60
tgagacagac	gaccaccata	ttcactgagg	tctaaatttg	cagtttccac	taatgacatt	120
ttgatttccc	aacagagata	cttctggtct	tactgcacag	tcttttaaga	gaaatacttc	180
cattatgcc	cattgtcctt	gatccgtaag	tgatgtgtta	aggtgcttca	aaggaactct	240
gacctctgaa	gtacttgagc	tacttttagta	tgtccagcct	attgcttttt	gttttagtgt	300
gtcaccataa	atatcagggg	cataaaaggc	tatctattct	taattcaagg	ataaaacaga	360
agaagcttgt	ggtataaaac	aatagttcaa	gatccag			397

<210> 695

<211> 609

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(609)

<223> n = A,T,C or G

<400> 695

ctgagcttcc	atttgtcagc	tagcactgng	gtagtcaacc	atgcgaatga	ggctattttg	60
gacctcatga	ttgtccagt	cctgggctga	taccngggga	aacgaaattt	tgtggctgcc	120
cacaaaatca	tggaataa	tgatttttta	gaaaacctcc	actgntttgt	tgtgcagcaa	180
taaataactg	aaacaccaat	ccaaaaaact	tataaagcta	taacaattaa	aacagnataa	240
taatagtncc	gggatacaaa	aatgggtcaaa	ttgaagagga	tacaaagcct	caaagcagtc	300
ctcactcata	ananccttgt	tgtatcacta	aaanggcatt	aaaattgaga	anaaggaana	360
actagtggat	taattaataa	atgagaagta	tccataagga	aaaattaaaa	ttnnattcct	420
gcttcacatt	atgaaaaaat	acaaacaaca	gattgattaa	agacttaaat	gngatcaaca	480
aaatgttaaa	actgtgataa	gaacatttaa	gaaaatagtt	ctatnaccct	gggataaaac	540
attttcttcc	aaggcattaa	agtgttaaat	gaaaagactg	atncatttat	tcattagaat	600
ttaaattcn						609

<210> 696

<211> 300

<212> DNA

<213> Homo sapien

<400> 696

ctgcaaaata	agcgtgctaa	attaaattgt	cttaaggttt	ttccacttca	ttttgtgact	60
ttgtgtgggt	cgaatttctc	agtattttta	ccagtgtgtt	gatgttaaag	tcaaaggctg	120
cagtatgtct	atattcttgc	tgtactcatt	ggtagtttca	gtatatgtaa	tgtgagttta	180
aatagtga	ttgtatctca	tattaacatt	tcaaagtctc	atattgaaaa	tggaataatag	240
taaacacggg	aattgatttt	attctgggtg	tctataatac	ttcattttta	atgtaaatgg	300

<210> 697

<211> 391

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(391)
 <223> n = A,T,C or G

<400> 697
 nngtcatgtn tgatgnatct gancaggttg ctccacaggt agctctagga gggctggcaa 60
 cttagagggtg gggagcagag aattctctta tccaacatca acatcttggt cagatttgaa 120
 ctcttcaatc tcttgcactc aaagcttggt aagatagtta agcgtgcata agttaacttc 180
 caatttacat actctgctta gaatttgggg gaaaatttag aaatataatt gacaggatta 240
 ttggaaattt gttataatga atgaaacatt ttgtcatata agattcatat ttacttctta 300
 tacatttgat aaagnaaggc atgggtgtgg ttaatctggg ttatttttgn tccacaagtt 360
 aaataaatca taaaacttga acaaaaaaaaa a 391

<210> 698
 <211> 536
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(536)
 <223> n = A,T,C or G

<400> 698
 ctgagcatatc agcaataaaaa ataacataat ttttatgtgt acaatattta tggaatacgt 60
 tactggaaca gataaataat ttagttaata acatgacaaa gaacagaaat tgtatacact 120
 atacagcata gtaatagaat aatgaatgat taaagttatt aatattaggt agaaaatgaa 180
 gggatatcttt gagagcagaa ctcaaggaag caagcaattt gccttatgag gaaagagtta 240
 cctgtggata aaggagaaac tgaaaaattt acaagtcaag actttttgag caaagacaaa 300
 aatatgacta tgagtcacca attcagtaca gtgaaaaaaaa agttgaagag atatcttgga 360
 agtaaacat gttgtggaag agcagggttt tgataatcat gggattattc tgaatgaatt 420
 ttaaatacgga taggaatata tgagataatt tcaccagaga ataatatgat catgtttgca 480
 tttaaagggt gtgtatctgg tgcactgngt agaataaata ggntatgtga gcaagt 536

<210> 699
 <211> 419
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(419)
 <223> n = A,T,C or G

<400> 699
 ngtcacactg agggcaggtg acaaggacct gacagagccc atgcagggct ttagatttgg 60
 acacacaaga gttgataact tcctcatgaa ctcccttgct gatctaaact catattatgg 120
 gttctgactg tttgagtaat catcttcaag gttaaacctc ttggcagtta cccttttcac 180
 aaagtgcaca gtgggaatcg agaatcgata ggggttaattt tggagcagtg gcttatacca 240
 ttcacctctg tttttttgtg attatttcac agataatgag accttaataa caaataggcg 300
 taaaaaaatt ttcacattga aatgatagaa acatttgatg taataaaaact tggttggctt 360
 gatattttta ggaattgaaa cctagcaatc ttattggaga gacaagaatt ggtctccag 419

<210> 700
 <211> 336
 <212> DNA
 <213> Homo sapien

<400> 700
 ccacttattg tccttaaaaa tccataactga tacatggaca gfaagtgtgt tttcagatgg 60
 agtaccagca ccgaaaatgg gttgaggag gatgggtgt atgtatgttt ctgcccacta 120
 attttgagca gccatattat gaattaaatc gtcacagcca agtaataacc caagaatggt 180
 atgagtttca tgtgtaatag ctcaaatgga ataagcatga atgctggagt ggaccattat 240
 cctcaaatat tctatgtcac ttctcattta aagactcttg ttatgaacta ttagaaactt 300
 taggcaaaat caaaagtatt tgcggcaaaa taaagg 336

<210> 701
 <211> 418
 <212> DNA
 <213> Homo sapien

<400> 701
 ccatgtgatg atgttgacaa cccctgaaga gcctcagtc attgttccac gtttaagaac 60
 taggaatacc aggactgatg caattctact gggtcactat cgcttggtcac aagacacaga 120
 caatcagacc aaagtatttg ctgtaataac taagaaaaaa gaagaaaaac cacttgacta 180
 taaatacaga tatttttcgtc gtgtccctgt acaagaagca gatcagagtt ttcattgtggg 240
 gctacagcta tgttccagtg gtcaccagag gttcaacaaa ctcatctgga tacatcattc 300
 ttgtcacatt acttacaaat caactggtga gactgcagtc agtgcttttg agattgacaa 360
 gatgtacacc cccttgttct tcgccagagt aaggagctac acagctttct cagaaagg 418

<210> 702
 <211> 261
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(261)
 <223> n = A,T,C or G

<400> 702
 gggcctgttg tgggggtggg ggaagcaggg aggggaacag ctaaataagg tgctgttgat 60
 ttgggttaaaa aatagtaggg ggatgatgct aataattagg ctgnnggtgg ttgtgttgat 120
 tcaaattatg tgttttttg agagtcagtg cagtggtaga aatataattg ttgggacnat 180
 tagnttttagc attggagtag gtttaggtta tgtacgtagt ctaggccata tgtgttggan 240
 attgagacta gtagggctag g 261

<210> 703
 <211> 261
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(261)
 <223> n = A,T,C or G

<400> 703

```

gggcctgttg tgggggtggg ggaagcaggg aggggaacan ctaaataagg tgcgtgtgat      60
ttggttaaaa aatagtaggg ggatgatgct aataaattagg ctgnnggtgg ttgtgttgat      120
tcaaattatg tgttttttgg agagtcattg cagtggtagt aatataattg ttgggacnat      180
tagnttttagc attggagtag gtttaggtta tgtacgtagn ctaggccata tgtgttgagg      240
attganacta gtagggctag g                                     261

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<210> 704
<211> 381
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(381)
<223> n = A,T,C or G

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<400> 704
ngtntgaatt ctattaaaga taaaaagagg agctggtacc atttcttctg aaactattac      60
aaacaactga aaaggtggaa tttctcccta attcatttta ggaggccagc attatactga      120
taccaaaacc tggcagaggt acaataataa aaggaaactt caagtcagta tcaactgatga      180
acaccaatgt gaaaatcctc aataaaatac tggcaaactg aattcagcag cacatcaaaa      240
agctaatacca ccacaatcaa gtcagcttca tccctgcgat gcaagtctgg ttcaacatat      300
gcaaataaat aaatacaatt catcagataa acagagctaa agacaaaatt cacatgattt      360
tctcaataga tgcagaaaag g                                     381

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<210> 705
<211> 477
<212> DNA
<213> Homo sapien

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<400> 705
ctgaaccctc gtggagccat tcatacaggt ccctaattaa ggaacaagtg attatgctac      60
ctttgcacgg ttaggtgacc gcggccggtta aacatgtgtc actgggcagg cgggtgcctct      120
aatactggtg atgctagagg tgatgttttt ggtaaacagg cggggtaaga tttgccgagt      180
tccttttact ttttttaacc tttccttatg agcatgcctg tgttgggttg acagtgaggg      240
taataatgac ttgttggtga ttgtagatat tgggctgtta attgtcagtt cagtgtttta      300
atctgacgca ggcttatgcg gaggagaatg ttttcatgtt acttatacta acattagttc      360
ttctataggg tgatagattg gtccaattgg gtgtgaggag ttcagttata tgtttgggat      420
tttttaggta gtgggtgttg agcttgaacg ctttcttaat tgggtggctgc ttttagg      477

```

```

<210> 706
<211> 266
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(266)
<223> n = A,T,C or G

```

```

<400> 706
ccatggctag gtttatagat agttgggtgg ttggtgtaaa tgagtgaggc aggagtccga      60
ggaggttagt tgtggcaata aaaatgatta aggatactan tataagagat caggntcgtc      120
ctttagtgtt gtgtatggct atcatttgtt ttgaggntag tttgattagt cattgttggg      180
tggtaattag tcggttgttg atgagatatt tggagggtgg gatcaataga gggggaaata      240

```


gaatgatcag tactgcggcg ggtagg

266

<210> 707

<211> 358

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(358)

<223> n = A,T,C or G

<400> 707

ccatcagaga aatgcaaadc aaaaccacaa tgagatacca tctcacacca gttagaatgg	60
caatcattaa aaagtcagga aacaacaggt gctggagagg atgtggagaa ataggaacac	120
ttttacaccg ntgggtgggac tgtaaaactag ttcaaccatt gtggaagtca gtgtggcgat	180
tcctcaagga tctagaacta gaaataccat ttgaccagc cggccaatat tcaacattct	240
taaaggaaaag aattttcaac ccagaatttc atatccagcc aaactaagct tcgttagtga	300
aggagaaata aaatacttta cagacaagca aatactgaga gattttgtca ccaccagg	358

<210> 708

<211> 491

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(491)

<223> n = A,T,C or G

<400> 708

cctactatgg gngttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga	60
gctgttcttc tttggactaa cagttaaatt tacaagggga ttttagagggt tctgtgggca	120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt	180
ttgtcgcttc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt	240
agctgttctt aggtagctcg tctgggttcg ggggtcttag ctttggtctt ccttgcaaag	300
ttattttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct	360
tggttataat ttttcatctt tcccttgctg tactatatct attgcgccag gtttcaattt	420
ctatcgcta tactttattt gggtaaatgg tttggctaag gttgtctggt agtaaggngg	480
gagtgggttt g	491

<210> 709

<211> 460

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(460)

<223> n = A,T,C or G

<400> 709

nggttttttt tgtagagcaa ataatttatg caaaatatgt taaaaaatct gggatgctaa	60
atagttgaca caagtactgt gtttgacatt tagtttcatt tgaattagta atagaatttg	120
ctccttccaa catttacatc ttttttcttt ctgactttat atattttcaa taaaaatttg	180

ctccacagtt	tttaagntca	ttcttcttga	atccgntttt	acatttgctg	ngacaaacct	240
gcataaaact	agattttata	gatataactt	ctttggaaga	gataaaaatt	caaaagtttg	300
acattgcttt	canttatctt	tttcttcatt	gttttgattg	gcccttgta	gattgatgta	360
ttgccaatct	acttttgatg	gcatgaatnt	aaaatgacaa	cataaaaagc	ncttctagtg	420
caacagtaat	tgaaacttgc	agttttccat	taaaaaaaaa			460

<210> 710

<211> 542

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(542)

<223> n = A,T,C or G

<400> 710

ctgttacagt	gacaagagat	aaaaagatag	acctgcagaa	aaaacaaact	caaagaaatg	60
tgttcagatg	taatgtaatt	ggagtgaata	actgtgggaa	aagtggagtt	cttcaggctc	120
ttcttggaag	aaacttaatg	aggcagaaga	aaattcgtga	agatcataga	tcctactatg	180
cgattaacac	tgtttatgta	tatggacaag	agaaataactt	gttggttgc	gatatactcag	240
aatcggaatt	tctaactgaa	gctgaaatca	tttgngatgt	tgtatgcctg	gtatataatg	300
tcagcaatcc	caaactcctt	gaatactgtg	ccaggatttt	taagcaacac	tttatggaca	360
gcagaatacc	ttgcttaatc	gtagctgcaa	agtcagacct	gcatgaagtt	aaacaagaat	420
acagtatttc	acctactgat	ttctgcagga	aacacaaaat	gcctccacca	caagccttca	480
cttgcaatac	tgctgatgcc	cccagtnagg	atatctttgt	taaattgaca	acaatggacc	540
tg						542

<210> 711

<211> 394

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(394)

<223> n = A,T,C or G

<400> 711

caaaccact	ccaccttact	accagacaac	cttagccaaa	ccatttacct	aaataaagta	60
taggcgatag	aaattgaaac	ctggcgcaat	agatatagta	ccgcaaggga	aagatgaaaa	120
attataacca	agcataatat	agcaaggact	aaccctata	ccttctgcat	aatgaattaa	180
ctanaaataa	ctttgcaagg	agagccaaag	ctaagacccc	cgaaaccaga	cgagctacct	240
aagaacagct	aaaagagcac	accgtctat	gtagcaaaat	agtgggaaga	tttataggna	300
gaggcgacaa	acctaccgag	cctggtgata	gctggttgtc	caagatagaa	tcttagttca	360
actttaaatt	tgccccacaga	accctctaaa	tccc			394

<210> 712

<211> 552

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(552)

<223> n = A,T,C or G

<400> 712

gagggtctgta naatgccagg ctcaaatttg tctttataat ttaataccag aaatctttcc	60
cttgtgatgt ttctttcttt ctggattgcc tctatagcag gggatagcgg gggaggataa	120
ggcacatctt tgntgtactg agaaatttga ccacgcagga tgatgtggct gttctcattc	180
atctgcacag agaaaaataa tgataaaata tccctttcct atgtttactg attttatggc	240
tgccataatg gaagcctcct tgactattta atcctttctg tcaactagggt tcgatttttt	300
ttttaattta cctgttagag gtatttaana attttaacta gctanaaata attacattcc	360
aaaggaacac caaggcaaat aaatggttgg taatcagcaa aagaattaca ttagttgttg	420
ntgctactta ttagggggag aactgttttt ttttaaattt aaacaattta ataatctcaa	480
ctgcaaataa ttttagatgc agcaaaggac tatgtagncg ttaatacctc atgttgatat	540
tttcataata tt	552

<210> 713

<211> 518

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(518)

<223> n = A,T,C or G

<400> 713

ccaaaaactg gaagcagctc actaaacaaa cagtggcata cccatagaac tgcatacttc	60
tcagcagtat gaaagaatga gctacttata taagcatcat tgataaacct caaaaaaaaa	120
atgccacatg aanaaaccca aagggganaa acataaaaaac tttatatgtc agtcatataa	180
aattctanaa aatgcaaact aatccatcnt aaaggaaagt aaatcaacag ttgtctggag	240
gaccananag agcaggagga ganagattat taaaggggtt aaagtaaatt tgggagtgcc	300
cttcnctttt taaatnctat gaaaatgaaa gtaaaggcnc atgcatgttg taaactaata	360
gtaacaaaca naatgggttg gagtgggttg ttgtctgggg acatcattac aaaatgtaag	420
ccagtttatn taaattttga aaagaccgtg gactctgata tgactgatna atgttggaag	480
agataagtgt gctgcaaagt ggggaattaa taaaacag	518

<210> 714

<211> 281

<212> DNA

<213> Homo sapien

<400> 714

ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt	60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct	120
atttcttgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg	180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgata atgaaagggtg	240
ataagctctt ctatgatagg ggaagtagcg tctttagtagac c	281

<210> 715

<211> 443

<212> DNA

<213> Homo sapien

<400> 715

cttgaaatca gcaacacact tacaaatgag aaaatgaaaa tagaagagta tataaagaaa	60
gggaaagagg attatgaaga gagtcatcag agagctgtgg ctgcagagggt atccgtactt	120

gaaaactgga	aggagagtga	agtggtataag	ctacagatca	tggagtcaca	agcagaagcc	180
tttctgaaga	agctggggct	gattagccgt	gacctctgcag	catatcccga	catggagtct	240
gatatacggt	catgggaatt	gtttctttct	aatgtttacaa	aagaaattga	gaaagcaaag	300
tctcagtttg	aagaacaaat	taaggcaatt	aaaaatgggt	cccggctcag	tgaactttct	360
aaagtgcaga	tttctgagct	ttcatttctt	gcctgtaaca	cggttcatcc	cgagttactc	420
cctgagtcct	caggccacga	tgg				443

<210> 716

<211> 639

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(639)

<223> n = A,T,C or G

<400> 716

ccaaanaaaaa	tgaagtacag	agtcctgcata	gtaagctttac	agataccttg	gtatcaaaac	60
aacagttgga	gcaaagacta	atgcagttaa	tggaaatcaga	gcagaaaagg	gtgaacaaag	120
aagagtctct	acaaatgcag	gttcaggata	ttttggagca	gaatgaggct	ttgaaagctc	180
aaattcagca	gttccattcc	cagatagcag	cccagacctc	cgttccagtt	ctagcagaag	240
aattacataa	agtgattgca	gaaaaggata	agcagataaa	acagactgaa	gattcttttag	300
caagtgaacg	tgatcggtta	acaagtaaag	aagaggaact	taaggatata	cagaatatga	360
atttcttatt	aaaagctgaa	gtgcagaaat	tacaggccct	ggcaaagag	caggctgctg	420
ctgcacatga	attggagaag	atgcaacaaa	gtgtttatgt	taaagatgat	aaaataagat	480
tgctggaaga	gcaactacaa	catgaaattt	caaacnaaat	ggaagaattt	angattctaa	540
atgaccaaaa	canagcatta	aatcagaag	ttcagaagct	gcagactctt	gtttctgcac	600
angcctaata	aggatgntgn	ggaacaaatg	gaaaaattg			639

<210> 717

<211> 473

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(473)

<223> n = A,T,C or G

<400> 717

nntgaggcta	ctgctgtttt	attacaacat	tacctcttgt	ttttataaag	tgtaccaaga	60
tttaaatgga	taactttatt	ttacttgaaa	aaaaaaagtt	tnntttatca	ccagtgttac	120
agttgtcttc	tggtttcttt	tggtttgntt	tatttgnntt	ccttttttagc	caaagagtga	180
acagaanatt	ttcttatttt	ggtgggtatt	cattttactt	ttaaaagtga	ttggtggatt	240
ttagactaat	tatgggggaa	tttgccacca	aaataaaaaa	tatgtaaagn	gtagtgatta	300
cagagtgggt	aaaatgtggg	ttagtactta	tttattccat	taattgatta	tttgactggt	360
tataaagaaa	gttgctttat	ttcttttaac	atcttcaaaa	gatgatcctt	tcttgtcaca	420
ttatagccaa	aagaagcaga	gaacttcact	gtctgcattt	ggttcctggt	tgg	473

<210> 718

<211> 207

<212> DNA

<213> Homo sapien

<400> 718
 ggtaaagtct agtataatat ttaccatctc acttctagga atactagtat atcgctcaca 60
 cctcatatcc tccctactat gcctagaagg aataatacta tcaactgttca ttatagctac 120
 tctcataacc ctcaacaccc actccctctt agccaatatt gtgcctattg ccataactag 180
 ctttgccgcc tgcgaagcag cggtagg 207

<210> 719
 <211> 255
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(255)
 <223> n = A,T,C or G

<400> 719
 cctatattac ggatcatttc tctactcaga aacctgaaac atcggcatta tcctcctgct 60
 tgcaactata gcaacagcct tcataggcta tgcctcccg tgaggccaaa tatcattctg 120
 aggggccaca gtaattacaa acttactatc cgccatccca tacattggga cagacctagt 180
 tcaatgaatc tgaggaggct actcagtaga cagncccacc ctcacacgat tctttacctt 240
 tcacttcac tggcc 255

<210> 720
 <211> 455
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(455)
 <223> n = A,T,C or G

<400> 720
 ccaatgtcga aacctacaag atttccttaa aatctctaata agaggcatta cttgctttca 60
 attgacaaat gatgccctct gactagtaga tttctatgat ccttttttgt cattttatga 120
 atatcattga ttttataatt ggtgctattt gaanaaaaaa atgtacattt attcatagat 180
 agataagtat caggtctgac ccagtgga aacaaagcca aacaaaactg aaccacaaaa 240
 aaaaaggctg gtgttcacca aaaccaaact tgttcattta gataatttga aaaagctcca 300
 tagaaaaggc gtgcagtact aaggaacaa tccatgtgat taatgnttnc attatgttca 360
 tgtaanaagc cccttatttt tagccataat tttgcatact gaaaatccaa taatcagaaa 420
 agtaattttg ccacattatt tatnaaaaat gttcc 455

<210> 721
 <211> 530
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(530)
 <223> n = A,T,C or G

<400> 721
 ccagtgttg ctgccgtggg ttagtgattg ggtgttagaa ataaaaactc aggtctattt 60

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cttaccagtc agtaacaatt tttagagaat gtacttggtata tataatatat ggacttcagg      120
aacttttattg gggngggggg ttaattttgc cttaccctgt tcactttcag atgattaggc      180
ttttgcactt tagaatgaga aacttgtgac gttagtgtgt tcttactagc ttttaatttgt      240
atgtagcaat gaattgtgaa tcttagtgca gtgggttttt ttaaaaaact caaaaagctg      300
ggaattaaagt ggtttcagta ataatgctat accgaggtgc ttgcattgta tttcataatt      360
ttgttacaaa ccaaaattat ttttaatgan aacgggtcttg ggttcagagg tgtgatgcca      420
gaatgtattt tcgtactgtt aggcccttgg aacagatacc ggtgctttct tgaaagatga      480
aagaaatgca atgggtgctc ttcatgcaag gttgcaaacc taccaagaat      530

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<210> 722
<211> 242
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(242)
<223> n = A,T,C or G

```

```

<400> 722
ccaagggtca tgatggcagg agtaatcana ggtgntcttg tgttggtgata agggngggaga      60
ggttaaaagga gccacttatt agtaatgttg atagtagaat gatggctagg gtgacttcat      120
atgagattgt ttgggctact gctcgcatg cgccgatcag ggcgtagttt gagtttgatg      180
ctcatcctga tnagaggatt gagtaaacgg ctaggctaga ggtggctaga ataaatagga      240
gg                                           242

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<210> 723
<211> 472
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(472)
<223> n = A,T,C or G

```

```

<400> 723
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga      60
gccgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca      120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt      180
ttgtcgctc nacctataaa tcttccact attttgctac atagacgggt gtgctctttt      240
agctgttctt aggtagctcg tctggnctcg ggggtcttag ctttggtct ccttgcaaag      300
ttattttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct      360
tggttataat ttttcatctt tcccttgcg tactatatct attgcgccag gtttcaattt      420
ctatcgcta tactttattt gggtaaattg tttggctaen gttgtctggt ag              472

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<210> 724
<211> 292
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(292)
<223> n = A,T,C or G

```

<400> 724

nccaccactg cagccctaca tacagntgaa aaaaaattcc attctgttaa catttgtttt	60
ataagttttc acncaatata caaaaaaccc ctctgcactt cttgtaaaga acaaaaaaga	120
tacacaacag ttaagcgtaa agatcacagg caatagcatt caaacatgga tgtgggnaga	180
gaaaggagta cctggcatga gtacctgctt agttngactg aatccttgat ttttaatttg	240
gcttttcatg ggccgntcac aacaccaacg ctgngngagg tatggtagtc ag	292

<210> 725

<211> 122

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(122)

<223> n = A,T,C or G

<400> 725

atagaaaggg catacccaaa atgttactga aaatntaata caaattccaa gattcaccaa	60
ngaagtaaca aaaacctggc ctgcangngg ncccctatcc cgtggctcca tggntgatgt	120
gg	122

<210> 726

<211> 477

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(477)

<223> n = A,T,C or G

<400> 726

ctgaaccctc gtggagccat tcatacaggt ccctaattaa ggaacaagtg attatgctac	60
ctttgcacgg ttaggggtacc gcggccggtta aacatgtgtc actgggcagg cgggtgcctct	120
aatactggtg atgctagagg tgatgttttt ggtaaacagg cggggtaaga tttgccgagt	180
tccttttact ttttttaacc tttccttatg agcatgcctg tgttgggttg acagtgaggg	240
taataatgac ttgttggtga ttgtanatat tgggctgtta attgtcagtt cagtgtttta	300
atctgacgca ggcttatgcg gaggagaatg ttttcatgtt acttatacta acattagttc	360
ttctataggg tgatagattg gtccaattgg gtgtgaggag ttcagttata tgtttgggat	420
tttttaggta gtgggtgttg agcttgaacg ctttcttaat tggcggctgc ttttagg	477

<210> 727

<211> 416

<212> DNA

<213> Homo sapien

<400> 727

cctgtctttg aatggatgaa atagggttaat aaaaaacatc actgtttaaa aactagaaca	60
ctgaaaaatt ctaggaaagc ttattttccc ttatattttt atgggtacttt caacacttaa	120
taacactatt tcaattaagt tttctcctag agtttatagt atatcagtac attcttttct	180
gtggatgcaa taatatagaa tcttattcca aatcttactg gcaggttctc ttaaattctt	240
caacggctgc catagtgatt aacccaaatt agttatgatt tctgcctatc tgtgtgagaa	300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa	360

atgatgacag tcattttata tcaccttcaa ttacccaaca gcttttaata gtctgg 416

<210> 728
 <211> 416
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(416)
 <223> n = A,T,C or G

<400> 728
 cctgtctttg aatggatgaa atagggttaat aaaaaacatc actgttttaa aactagaaca 60
 ctgaaaaaatt ctaggaaagc ttatttttccc ttatatatttt atggtacttt caacacttaa 120
 taacactatt tcaatttaagt tttctcctag agtttatagt atatcagtac attcttttct 180
 gtggatgcaa taatatagaa tcttattcca aatcttactg gcagggttctc ttaaattctt 240
 caacggctgc catagtgatt aaccaaatt agttatgatt tctgcctatc tgtgtgagaa 300
 cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa 360
 atgatgacag tcattttata tcaccttcaa ttacccaaca gcttttaata ntctgg 416

<210> 729
 <211> 564
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(564)
 <223> n = A,T,C or G

<400> 729
 ctgtgagtag aggagtcttc ccgagagtag cagttgttga tccaaatgat tgaagccttc 60
 aggtaaggga ataactgctg caggaattct ttcttgaaga atttaagctg tttggtaaga 120
 attctgtaac tacatacctt tgaaacacta ttcacattca aataaacgct tgttttctag 180
 ccaggcacag gctcaattag tttttcaaac tctagccaag gcagtatttc atttgggaaa 240
 tcatgcaaca gaactgctca attcttaact tctcctgctg ttaacattta cacttagact 300
 gccagcaaca gttaacttaa attttggtct caagggaaca aaaaaaatt gcattcagaa 360
 tttaatatag tatttttaaaa ctaatttttag cctgtaagnc attatgagca atagtaactt 420
 ttatacctcc tcatcttgnc tgataatata ttctatatgc tgncaatctg attatatagt 480
 ctatatgcta gaagttgctg attttcattc tgccaccaa aaaaactgtc cttttttttt 540
 tatgggggaa aaagggaatt taaa 564

<210> 730
 <211> 310
 <212> DNA
 <213> Homo sapien

<400> 730
 ccatttttat ttcttcttca gagaagtgtt tatttaggtc tgttgcccat ttacaatta 60
 ggccatatgt tttcttgctg ttgagttgta tgtgtgtttg tataaatttt gcatattaac 120
 cccttatcac acgtatgttt tttaaaataa attttgctta ttaattcttt atcagatgta 180
 tggtttccaa atatattctt ccgatccatg gattctcttt tttgttatga ttgtttcttt 240
 gctcttcgga agctttttgt tttgttttgt tatttgtttt actttgatat agtcccat 300
 attgtttttg 310

<210> 731
 <211> 467
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(467)
 <223> n = A,T,C or G

<400> 731
 ngacaacctt agccaaacca tttacccaaa taaagtatag gcgatagaaa ttgaaacctg 60
 gcgcaataga tatagtaccg caagggaaaag atgaaaaatt ataaccaagc ataataaagc 120
 aaggactaac ccctatacct tctgcataat gaattaacta gaaataactt tgcaaggaga 180
 gccaaagcta agacccccga aaccagacga gctacctaa aacagctaaa agagcacacc 240
 cgtctatgta gcaaaatagn gggaagattt ataggnagag gcgacaaaacc taccgagcct 300
 ggtgatagct ggttgtccaa gatagaatct tagntcaact ttaaatttgc ccacagaacc 360
 ctctaaatcc ccttgtaaatt ttaactgnta gnccaaagag gaacagntct ttggacacta 420
 ggaaaaaacc ttgtagagag agtaaaaaat ttaacacca tagtagg 467

<210> 732
 <211> 492
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(492)
 <223> n = A,T,C or G

<400> 732
 cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
 gctgttcctc tttggactaa cagctaaatt tacaagggga tttagagggt tctgtgggca 120
 aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
 ttgtcgctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
 agctgttctt aggtagctcg tctggnttcg ggggtcttag ctttggtctt ccttgcaaag 300
 ttatttctag ttaattcatt atgcagaagg tataggggtt agnccttgct atattatgct 360
 tggntataat ttttcatctt tcccttgccg tactatatct attgcgccag gtttcaattt 420
 ctatcgctta tactttattt gggtaaatgg tttggctaag gttgtctggt agtgaggcgg 480
 agngggtttg gg 492

<210> 733
 <211> 562
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(562)
 <223> n = A,T,C or G

<400> 733
 ntgaaatggc aatagcattc actgtcgtat tttgcagtgc tcaggaagtg ggacgttaac 60
 tttgaagggtg cttgtttgta ttagctctgc taggtttacc tctacaacgt agatttcagc 120

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agctatgctg actgacacta cattctagtt ctttaagattt tttttccana tcccccccttc      180
cccagctaga catacgtagc atactttcat cttattcagt ctttctgtaa cctgctgctg      240
cttttagtcc tcctcacctc agatcggaat caatggagtg ggcccagagg atacatttta      300
attccagtaa tggtaggtag atttgcctg ctttctaaaa catctcctca tttcatattt      360
ccactccata ttgattccat aagggaaaat taatgggtgn ttcttccttt agggaggcaa      420
tgcaaagagn gtggacatct tctaattctg aggaacagtn gttgatttcc cttgaaggag      480
cttacatatt gactgtnttt cacaataacc tgnttgcccc agntcaatcc ctcattttta      540
tacttaatgt tggtnctggg ct                                             562

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<210> 734
<211> 265
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(265)
<223> n = A,T,C or G

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<400> 734
nggtccagaa caagagaaat aactgcagaa aacacatatg gttggaaacc atgcgcttgt      60
gacttttttct gtagcctatg ggagtggaca gagtgggtaa cccaagatgt ttttaagact      120
gactggacta agaatggcgt acttatagcc aactacttcc cccctaattg gactgaaggg      180
attcataatg atcacaatta gcattacggt taagtatttt aggggtgacg tctaagctca      240
cacttgaaag gtatttatct aatgg                                             265

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<210> 735
<211> 216
<212> DNA
<213> Homo sapien

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<400> 735
atttaatacgt tgctcactgc tcggcacgcg ctgaagctac agttaacaat cagtgagcac      60
atattaaatg ataaaaataat gctgatggta aacattcata acagcagagt aagatttttg      120
cagttttgtg tctcggtaac ataactgtaa ccttagatga acacctatcc cttcatgatc      180
tgacttttaga ggcaaggagt ttgtaacatc taatgg                               216

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<210> 736
<211> 285
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(285)
<223> n = A,T,C or G

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<400> 736
ctgaaaggca acntggagac tagttagtct agtccccctca tattataaat tggtagtctg      60
agggccaggca gtaaaattgct atggagctct ccaattttaag gccagtttga ctccaagggt      120
agggcttcta gtaaaatttt gtgattaaat tggaaactct aattttatttt tctatgngtt      180
tttggtacct aatcctcata agcaagccat atttcaaggc tgatcaatga aaacacaaaa      240
taccaaagct tcctttccct tccaaattta ctgacccttt gtcag                               285

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<210> 737

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<211> 509
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(509)
 <223> n = A,T,C or G

<400> 737
 agangaagaa gangaagatt aagggaaaag tacatcggtc aagaagagct caacaaaaca 60
 aagcccatct ggaccagaaa tcccgcacgat attactaatg aggagtacgg agaattctat 120
 aagagcttga ccaatgactg ggaagatcac ttggcagtga agcatttttc agttgaagga 180
 cagttggaat tcagagccct tctatttgtc ccacgcagtg ctctttttga tctgtttgaa 240
 aacagaaaaga aaaagaacaa catcaaattg tatgtacgca gagttttcat catggataac 300
 tngaggagc taatccctga atatctgaac ttcattagag ggggtgnaga ctcgaggat 360
 ctccctctaa acatatcccg tgagatgttg caacaaagca aaattttgaa agttatcang 420
 aagaatttg gtcaaaaaat gcttanaact ctttactgaa ctggcggaag atnaagagaa 480
 ctncagana ttctatgagc agntctctt 509

<210> 738
 <211> 97
 <212> DNA
 <213> Homo sapien

<400> 738
 cagtgaattg aatacgactc ctatagggcg aattgggccc tctagatgca tgctcgagcg 60
 gccgccagtg tgatggatat ctgcagaatt cgccctt 97

<210> 739
 <211> 209
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(209)
 <223> n = A,T,C or G

<400> 739
 ccgncagtgt gatggatatt tgcagaattc gcccttagcg gcccgcgcgg gcagggctct 60
 tatatatagt agcttagttt gaaaaaatgt gaaggacttt cgtaacggaa gtaattcaag 120
 atcaagagta attaccaact taatgttttt gcattggact ttgagttaag attatttttt 180
 aaatcctgag gactagcatt aattgacgg 209

<210> 740
 <211> 164
 <212> DNA
 <213> Homo sapien

<400> 740
 ccaagctaatt gggtagact gtgaatgcaa ctctaattgca gcctggcgta aatggctcta 60
 tgggcactaa ctttcaagtt aacacaaaca gaggaggtgg tgtgtgggaa tctggtgcag 120
 caaactccca gactacatca tggggaagtg gaaatggcgc aaat 164

<210> 741
 <211> 514
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(514)
 <223> n = A,T,C or G

<400> 741
 ccagtcagaa ttgagatgtg ctgtgagtg c aaatacact caaatctaag acttagtatg 60
 gaagaaaaag aagataaggt gnttcattaa taatctttta tattgattac atgttgaaat 120
 gatattttta atatactggg ttacataaac tgttattaag attaattttg cttgtttctt 180
 ttttaatatg gctactagaa aattaaaaat tatgttgtgg ttcacattat atttctgttg 240
 aacaatgtgg acatagataa tctacagtca ttacattagc cttagaattt agcatcatac 300
 ttttaagcac tctgggggtac taacttgaac tcccagaaac ccataagcac actctgcata 360
 taaattattg caaaattcat tcttatctct ctgaaagata tgcattttta gggtaaaaag 420
 aattcacaaa atattganc cttacaaat gtcaattagt atatggagag agctaaagga 480
 cttcntgtag actggtncat tggggaaaaa caga 514

<210> 742
 <211> 439
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(439)
 <223> n = A,T,C or G

<400> 742
 gcaggctcta tgcatagtta ataagggnta taatctactc aacatggaaa atgggagcct 60
 atttgcaaac acacgagtaa ttaaagtacc aattctctct tagtttcttt ttttatagtt 120
 ggnttatatt gcaattataa atgntaaaca tccctagaga tgaaagttaa aatggctgat 180
 cacagatcag tagcaaaaata caaattgaca attcaaaatt ataaataaaa ctctgttgag 240
 gatgtttaac tttgagcctc caaatttaag agctaagctt ggaagaaaca aatttatagg 300
 ttatatttcc ctcttaaatt aaaaaacaaa cttcctctgg cagtagnttg tgaattcctt 360
 tcattgnaat gataccatga ttacaggatc aaaaatgctt aacttacttg ccattctgct 420
 cacatcatca cagttgttt 439

<210> 743
 <211> 275
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(275)
 <223> n = A,T,C or G

<400> 743
 cangacgcta cttcccctat catagaagag cttatcacct ttcatgatca cgccctcata 60
 gtcattttcc ttatctgctc cctagtcttg tatgcccttt tctaacact cacaacaaaa 120
 ctaactaata ctaacatctc agacgctcag gaaatagaaa ccgtctgaac tatcctgcc 180

gccatcatcc tagtcctcat cgccctccca tccctacgca tcctttacat aacagacgag 240
gtcaacgatac cctcccttac catcaatca attgg 275

<210> 744
<211> 295
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(295)
<223> n = A,T,C or G

<400> 744
ctgtncctttt aaaaaatctg gatgtttttt atttagtgat tggtcgacaa ttagctgctt 60
caaaacataa tgtgcattgc ttatgaatgc cttcatatac taatacagat actctgataa 120
tattacactc taataaggat aatgctgaat tttgaaagga cacaaaacat ctaatgccaa 180
tatatacatg attagccaac atctttgcta tcaagaccac tcgtttttta ataaagatgc 240
aagtgtcagt tgtagattat tgggatgaag ctaaattccc agaatgcagc agcag 295

<210> 745
<211> 477
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(477)
<223> n = A,T,C or G

<400> 745
cgcgttactg tacatatgtc tagcaggaga caactggaaa tactaaacaa atactggaat 60
tcacattaca gacagacgaa accaacaatg atgccacaca taacttcctt tgtagtttca 120
cagagagcct atttgtggtt gctcaggtgg ggtcatacat tgcttgacaga aatggcctga 180
tcatagctct atgaaacaat gaattcggaa tgaaatctta ccatgacacc tctctgtagg 240
aaagaaatgt tgcttcacgt gtgctaagtt gagataataa tatttcacat atttatatac 300
agagaatcac tctcaaattt aacccaagat aagcaatagg atttgggggt gacttgtaca 360
catttctaac aacacttttc ttttttctag aggtcactct caaacactga tatatcacta 420
tagtttgagt gtanggattc agtaatcaaa ggttggttatt gcaaaagagc caggcag 477

<210> 746
<211> 524
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(524)
<223> n = A,T,C or G

<400> 746
ctgtgaaatt ggggttgggag agccaaaata ctttacaact tcagaccgga gaaaaggcca 60
gaggtgtgaa gttagactct atgatgaaac agagtcgtct tttgcgatga catgttggga 120
taatgaatcc atttactttg cacagagctg gatgccacga gaaacagtaa tatttgcttc 180
agatgtaaga ataaattttg acaaatttcg gaactgcatg acagcaactg taatctcaaa 240

```

aaccattatt acaactaatc cagatatacc agaagctaac attctgctga attttatacg      300
agaaaataaa gaaacaaatg ttctggatga tgaaattgac agttatttca aagaatccat      360
aaatttaagt acaatagttg atgtctacac agntgaacaa ttaaagggaa aagctttgaa      420
gaatgaagga aaagctgatc cttcctatgg catcctttat gcctacattt ccacactcaa      480
cattgatgat gaaactcaaa agtagttcga aatagatggt ccag                          524

```

<210> 747

<211> 456

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(456)

<223> n = A,T,C or G

<400> 747

```

cctcagttct tgattgtggt tgacggggcg tcaccatgaa ggagcccatt tagtataaag      60
cttccaacct tttctcttaa tcgtttcttt aatcttttaa accatcttca agtgcataagg      120
ggagtttccg atgccagagg atgaaagcaa gtgctttctc caccctctcc tcccagagtg      180
aaaacaaatc cttttgctga tacttggttc aaaagcatcc attgtaaagc ttctcagtga      240
cacaaaatac tgagagggtaa ctttttatca atcaaaccac ataccccaat ttaacacctt      300
tcagtgtctc gaattcaact gacagactaa aggggtgtttc ctgtaacagt ctgaaatatt      360
aagtgttttt tttgttttgt ttttaaatct tatttcagaa aacttctctc nggggtagga      420
aagtacacat gaagcagcaa agtaacgaag aaaaaa                                456

```

<210> 748

<211> 474

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(474)

<223> n = A,T,C or G

<400> 748

```

ccanaccagg gaaccaaagt cagacagnga agttctctgc ttcttttggc tataatgnga      60
caagaaaggg atcatctttt gaagatgttt aaagaaataa agcaactttc tttataaaca      120
gtcaaataat caattaatgg aataaataag tactaaccce cattttaacc actctgtaat      180
cactacactt tacatathtt ttatttnggn ggcaantcc cccataatta gtctaaaatc      240
caccaatcac ttttaaaagt aaaatgaata gccaccaaaa taagaaaatc ttctgttcac      300
tctttggcta aaaaggaaaa caaataaaac aaaacaaaaa gaaacagaag acaactgtaa      360
cactggtgat aaaagaaact ttttttttac aagtaaaata aagttatcaa tttaaatctt      420
ggncacttta taaaacaag aggtaatgtt gtaataaaac agcagtagcc tcag                          474

```

<210> 749

<211> 355

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(355)

<223> n = A,T,C or G

<400> 749

cctggggttnna gngggctgact gnaacctcca cttcctgttc tcagggaatc ctcctgcctc	60
agcctcctta gttagctggga ctacaggagt gtgcaaccat gcccactaa tttttgtatt	120
tttaatagag acagggtttc accatgttga tcagggttggc ctccaactcc tgacctcagg	180
tgatccacct gtcccagcct cccaaagtgc tgggattaca ggcattgagcc accacgcccg	240
gnccaggata aagtaaaaat ttgtaagcac acaaggccct ttgcaacctg gctcctgggt	300
actactttta nctcctcgcc ctcccaaagt tntctactgt ttttctanac atacc	355

<210> 750

<211> 493

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(493)

<223> n = A,T,C or G

<400> 750

ccatgctggc ctcgaactcc tgaactcagg tgatccaccc gcctcagtct cccaatagat	60
tacatatatt attaataaat tgcttccttt aacaccctat tcattgaatt ttccagtaaa	120
ccacaattac taattactcc tgaaatcaga aaagagggtta aaaagatttt ataacagtat	180
cctatgaaat ctactacttt caagtaatat tagttgaatt accaaaaccc gtcactcaag	240
ccaatgacta caattaagat atgagtaaca tttcctagat aaataaagtc aattaattat	300
atttgcattc gggaaataga gaaagtacat ataagccatg attttgaagn caaaagagag	360
agantatttg ccaaggagggt gtgagttata gtatgtaatt ataacatata gaagcttttt	420
gtatgctggc aactaatttt aatttcctac attnttatgg agatttctgc tattcttgtc	480
ctattttcca cct	493

<210> 751

<211> 364

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(364)

<223> n = A,T,C or G

<400> 751

cgaggctctgg naaggctacc aagtctgccc aganagctca gaaggctaaa tgaatattat	60
ccctaatacc tgccacccca ctcttaataca gtgggtggaag aacgggtctca gaactgtttg	120
tttcaattgg ccattttaagt ttagtagtaa aagactgggt aatgataaca atgcatcgta	180
aaaccttcag aaggaaagga gaatgttttg nggaccactt tggttttctt ttttgcgtgt	240
ggcagtttta agttattagt ttttaaaatc agtacttttt aatggaaaca acttgaccaa	300
aaatttgtca cagaattttg agaccatta aaaaagttaa atgagataaa aaaaaaaaaa	360
cntg	364

<210> 752

<211> 498

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(498)
 <223> n = A,T,C or G

<400> 752
 ctggattatg ggttgggnatt ggtcatatgt tagactccat acaggcatag ctatgatgca 60
 gtgaatccct tagaagttac aattctcaaa ttacatactt cctcagatgt aacattagaa 120
 ctcaatattt ctaacaataa cataaccagaa aaggctggac tggcactcat ctgctgacta 180
 acttgtagcc tcagtaatat gacatacttg cctttaacaa attatctcaa attaactaac 240
 agaccttcag aaaatggaga ttctttttga tggggacata atcaaattta agtctgagaa 300
 atatgcttaa cagttggaac tcaaattaaa tgtactgatt ttaaagttta gacattaaca 360
 agtgatanat tagcctcaaa aaaagacaat ttggnaagggn ttaggtcttt taatttggtg 420
 cttgntcaca acttgactgg tgcttctttc cttgctgctt cacatcaagc atggggccaa 480
 ttctattttc agtaaatg 498

<210> 753
 <211> 467
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(467)
 <223> n = A,T,C or G

<400> 753
 nacaacctta gccanaacca tttacccaaa taaagggata ggcgatagaa attgaaacct 60
 ggcgcaatag atatagnacc gcaagggaaa gatgaaaaat tataaccaag cataatatag 120
 caaggactaa cccctatacc ttctgcataa tgaattaact agaaataact ttgcaaggag 180
 agccaaagct aagacccccg aaaccagacg agctatctaa gaacagctaa aagagcacac 240
 ccgtctatgt agcaaaatag tgggaagatt tataggtaga ggcgacaaac ctaccgagcc 300
 tgggtgatagc tggntgncca agatagaatc ttagntcaac tttaaatttg cccacagAAC 360
 cctctaaaatc cccttgtaaa tttaactgtt agtccaaaga ggaacagctc ttggacacna 420
 ggaaaaaacc ttgcagagag agtaaaaaat ttaacaccca tagtagg 467

<210> 754
 <211> 196
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(196)
 <223> n = A,T,C or G

<400> 754
 gtcattgttca agtgttntaa tctgacgcag gcttatgcgg aggagaatgt tttcatgtta 60
 cttatactaa cattagttct tctatagggg gatagattgg tccaattggg tgtgaggagt 120
 tcagttatat gtttgggatt ttttaggcag tgggtgttga gcttgaacgc tttcttaatt 180
 ggtggctgct ttttagg 196

<210> 755
 <211> 381
 <212> DNA
 <213> Homo sapien

<400> 755
 ctggaaagga ttctgtacat ataagacatc aaatattgag ggatactgga actttttaaat 60
 taatgggcaa agaaagtcaa caaaggaagt tcatatgaaa tcaaactagt aatatgatta 120
 caaaaaaaaaa gtttaaaatt tttcttgccc ccagtccttat catttctgag ccaaatacaa 180
 ttctatcgaa atcacctgaa actgaaatca ccattctagg ctgggttttcc cataaagatg 240
 gactgctcca aaaagaggaa tcaagaaaga atttggctca cagtgaatta ttcactttgt 300
 cttagttaac taaaaataaa atctgactgt taactacaga aatcatttca aattctgtgg 360
 tgataataaa gtaatgaccg c 381

<210> 756
 <211> 341
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(341)
 <223> n = A,T,C or G

<400> 756
 ggntataaac ctattattta ttgcagaact aataaaaaat ccaaagcctt gtatttgtac 60
 atctttatta tctctaaagc actttcctca acctaatttc agtttttaca attggtactc 120
 aagaaaatag agacagaaat catttgattt tgcccagaaa ccattctgctt atatttataa 180
 ggccacctaa tttgaaatca catatagacc aggcgcggtg gtcacgcct gtaattccaa 240
 cactttggaa ggccaaggca ggtggatcac aaggtcaaga gattgagacc atcttgacca 300
 acatggcgaa accccgtctc taccaaaaat acaaaaatca g 341

<210> 757
 <211> 479
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(479)
 <223> n = A,T,C or G

<400> 757
 cgcnttactg tacatatgtc tagcagggag acaactggaa atactaaaca aatactggaa 60
 ttcacattac agacagacga aaccaacatg gatgccacac ataacttcct ttgtagtttc 120
 acagagagcc tatttgtggt tgctcaggtg gggcatataa ttgcttgag aaatggcctg 180
 atcatagctc tatgaaacaa tgaattcgga atgaaatctt accatgacac ctctctgtag 240
 gaaagaaatg ttgcttcacg tgtgctaagt tgagataata atatttcaca tatttatata 300
 cagagaatca ctctcaaatt taacccaaga taagcaatag gatttggggg tgacttgtnc 360
 acatttctaa caacactttt cttttttcta gaggtcactc tcaaacactg atatatcact 420
 atagnttgag ngtagggatt caagtaatca aaggttggtta ttgcaaaaaga gccaggcag 479

<210> 758
 <211> 267
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature

<222> (1) ... (267)

<223> n = A,T,C or G

<400> 758

ccatgnctag	gtttatagat	agttgggtgg	gttgggtgtaa	atgagtgagg	caggagtccg	60
aggagggttag	ttgtggcaat	aaaaatgatt	aaggatacta	gtataagaga	tcagggttcgt	120
ccttttagtgt	tgtgtatggc	tatcatttgt	tttgagggtta	gtttgactag	tcattgttgg	180
gtggtaatta	gtcggttgtt	gatgagatat	ttggagggtgg	ggatcaatag	agggggaaat	240
agaatgatca	gtactgcggc	gggtagg				267

<210> 759

<211> 449

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (449)

<223> n = A,T,C or G

<400> 759

cgaggctcttg	aaatcagcaa	cacacttaca	aatgagaaaa	tgaaaataga	agagtatata	60
aagaaaaggga	aagaggatta	tgaagagagt	catcagagag	ctgtggctgc	agaggatatcc	120
gtacttgaaa	actggaagga	gagtgaagt	tataagctac	agatcatgga	gtcacaagca	180
gaagcctttc	tgaagaagct	ggggctgatt	agccgtgac	ctgcagcata	tcccagacatg	240
gagtctgata	tacgttcatt	ggaattgttt	ctttctaatg	ttacaaaaga	aattgagaaa	300
gcaaagtctc	agtttgaa	acaaattaag	gcaattaaaa	atggttcccg	gctcagtga	360
ctttctaaag	ngcagatttc	tgagctttca	tttctgcct	gtaacacggt	tcattccgag	420
ttactccctg	agtcttcagg	ccacgatgg				449

<210> 760

<211> 414

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (414)

<223> n = A,T,C or G

<400> 760

ccatnaactg	gaagcagctc	actaaacaaa	cagnggcata	cccatagaac	tgcatacttc	60
tcagcagtat	gaaagaatga	gctacttata	taagcatcat	tgataaacct	caaaaaaaaa	120
atgccacatg	aagaanccca	agggggagaa	acataaaaaac	tttatatgnc	agncatataa	180
aattctagaa	aatgcaaaact	aatccatcnt	aaaggaaagt	aaatcancag	ttgtctggag	240
gaccanagag	agcaggagga	gagagattnt	taanggggtt	aaagtaaatt	ngggagtgcc	300
cttccatttt	taaatnctat	gaaaatgaaa	gtaaaggccc	ntgcatgttg	taaactaata	360
gtaacaaaca	gattgggttg	gagtgggttg	ttgtctgggg	acatcattac	aaan	414

<210> 761

<211> 428

<212> DNA

<213> Homo sapien

<400> 761

```

gagcctcact aaaataacag atttcagtat agccaagttc atcagaaaga ctcaaattgga      60
atgatttaca agatagaaca ctttaaacca ggtcagtcct atctttttgt agctgaaggc      120
tatcagtcac aacacaattt cgcgtacacc tctgctcatt atggaattac acttaaaacg      180
aatctcaaga ggggtgaccat tgttgtttca gataccatcc ctaaggagag tgggttaacag      240
gaagattgcc agtggttactg atggaaagaa gtgtttgttt gttttttttc ttgtcaaaga      300
cttacaccat agtttttaaat taaactgtca ggcattttct cagacagggt ttccttttca      360
atgcagtaat gaagaactaa gataaaaatc atgacttttg actgccactc aacattatta      420
catgcacc                                     428

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<210> 762
<211> 574
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(574)
<223> n = A,T,C or G

```

```

<400> 762
caggtctgaa ctgataagta ttaagagacg tttgttgcta gttaagngtt ccagttgaga      60
gttcgaagtg aaaacctggg ctctttacca gtgttgagtg agaagattta tttctctttc      120
ctctgaattt accacatgta acatcacaga gacatgtaga gttcctttag gatttgcgat      180
ttgaaccagn ccagtctgat tttcaggtga attctgtgaa gagcttgatg ggggaagtct      240
gaagacagaa ggaattaggg aaaagggtga tacttacaga gtaaaggaaa taaatgaaaa      300
gataatggta tttttggtag ccacagggaa atagcaggag gggactggag atcacacaca      360
cgcacacgca cacacacaaa cacacacaca cgctaaaact caaactaaaa acctcccaaa      420
ggagctgctt tgtttgcaga cttcaattng aagtagatac taagggaag aatagaccag      480
ttaaatttca cctgaaaatc tcttccann cttcaaattg gctaaaatat cactgtcagc      540
ttagcatctc tncatgtatg tatatataga tgta                                     574

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<210> 763
<211> 465
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(465)
<223> n = A,T,C or G

```

```

<400> 763
cctactatgg gtgttaaaat tttttactct ctctacaagg ntttttecta gtgtccaaag      60
agctgttcct ctttggaacta acagttaaatt ttacaagggg atttagaggg ttctgngggc      120
aaatttaaag ttgaactaag attctatctt ggacaaccag ctatcaccag gctcggtagg      180
tttgctgcct ctacctataa atcttcccac tattttgcta catagacggg tgtgctcttt      240
tagctgttct taggtagctc gtctggtttc gggggcttta gctttggctc tccttgcaaa      300
gttatattcta gttaattcat tatgcagaag gtataggggt tagtccttgc tatattatgc      360
ttggatataa tttttcatct ttccttgcg gtactatata tattgcgcca ngtttcaatt      420
tctatcgcct atactttatt tgggtaaatg gtttggttaa ggttg                                     465

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<210> 764
<211> 151
<212> DNA
<213> Homo sapien

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<400> 764
 ctgtcaatta atgctagtc ttaggattta aaaaataatc ttaactcaaa gtccaatgca 60
 aaaacattaa gttggtaatt actcttgatc ttgaattact tccgttacga aagtccttca 120
 catttttcaa actaagctac tatatttaag g 151

<210> 765
 <211> 251
 <212> DNA
 <213> Homo sapien

<400> 765
 gaagagctta tcacctttca tgatcacgcc ctcatagtc ttttccttat ctgcttccta 60
 gtcctgtatg ccccttttct aacactcaca acaaaactaa ctaatactaa catctcagac 120
 gctcaggaaa tagtaaccgt ctgaactatc ctgcccgcga tcctcctagt cctcatcgcc 180
 ctcccatccc tacgcctcct ttacataaca gacgagggtc acgatccctc ccttaccatc 240
 aaatcaattg g 251

<210> 766
 <211> 375
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(375)
 <223> n = A,T,C or G

<400> 766
 cgagggtctgn cctcctgggt cttcatccat tattaacaga agagcatact gggttcgggc 60
 cataaaatct ttgggaaggg acaactgtaa aggaagttca tagtcgtcaa tatgaaggat 120
 tttaatttct ggctttccta tcttcttctt caggatagct tccttcagca tagaattggt 180
 ttccaatata aaatattttg ctgggttggt cgtactatgt aggctgacca ctgggaccct 240
 tggaccttca cagaataata agaaatgttg attcatggga ctaaaactgg catcaaaata 300
 tgtacattgt tctttcatga aattacatga aatgcattgg cgattcaata atccttcagt 360
 agaagcactg tacag 375

<210> 767
 <211> 485
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(485)
 <223> n = A,T,C or G

<400> 767
 cgagggtctga accctcgtgg agccattcat acagggtccct aattaaggaa caagtgatta 60
 tgctaccttn gcacgggttag ggtaccgcgg cccgttaaac atgtgtcact gggcaggcgg 120
 tgcctctaata actggtgatg ctagagggtga tgtttttggg aaacaggcgg ggtaagattt 180
 gccgagttcc ttttactttt tttaaccttt ccttatgagc atgcctgtgt tgggttgaca 240
 gtgagggttaa taatgacttg ttggtgattg tagatattgg gctgttaatt gtcagttcag 300
 tgtttttaac tgacgcaggc ttatgcggag gagaatgttt tcatgttact tatactaaca 360
 ttagttcttc tatagggtga tagatnggtc caattgggtg tgaggagntc acttatatgt 420

ttgggatttt ttaggtaagn ggggtgtgag cttgaacgct ttcttaattg ggggctgctt 480
ttang 485

<210> 768
<211> 379
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(379)
<223> n = A,T,C or G

<400> 768
ctgatattct attaaagata caaagaggag ctggnaccat ttcttctgaa actattacaa 60
acaactgaaa aggtggaatt tctccctaatt tcatttttagg aggccagcat tatactgata 120
ccaaaacctg gcagaggtac aataataaaa ggaaacttca agtcagtatc actgatgaac 180
accaatgtga aaatcctcaa taaaataactg gcaaactgaa ttcagcagca catcaaaaag 240
ctaattccacc acaatcaagt cagcttcac cctgcgatgc aagtctgggt caacatatgc 300
aatcaataa atacaattca tcagataaac agagctaaag acaaaattca catgattttc 360
tcaatagatg cagaaaagg 379

<210> 769
<211> 518
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(518)
<223> n = A,T,C or G

<400> 769
cgagggtccat atgatgatca gtctatatag tttaaggcgc agatacacia attttcaaaa 60
atatgggttag aatatagtca atatgaatgg aatagacaat gctttgaaaa tcaactggagg 120
gaggctttat tgtttgtgaa aacatgttgt catcactttt tgctttaagc ccttggtggt 180
gaaataactc aaaccattct tccttatgct gaagatcgag aaccccaagt atcacatcta 240
ccatcccaact catcaatgtg attgggtcagt ctttgctgag gncctgcata gccagtttta 300
aagtttagagt tcttgcatat acatatgaaa aggcattgta cttgtgcttt caaagagctt 360
tttgcttggt gtaaaaagaa aactcaaatt acagtgtgat gtggaatata atggtggttag 420
tttcatcgag atgatgggaa agaattgata agataaagcn gaaagatgag cagaattttc 480
agattgggtn tggaagagc acttaagaaa gaggggtgg 518

<210> 770
<211> 378
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(378)
<223> n = A,T,C or G

<400> 770
tatgggtcct gagtgtggaa tataagataa caagacaatt cccttgcttt caagggaaat 60

```

cacactttat aaaactttga attcttgaaa tgggtttcag aggttccaag gtcaaattca 120
agaataagag ttaagaagaa aaagactatg agaaaggaag tgntgacccc atttgcatTT 180
aaatggcagg aatagtctca atctactcat tggggaaaaa tgtatgttgc atatttttga 240
gatattgcaa cttgctctct ctctttgccca cccacccctt tgnatgctc tgTTTTTggg 300
ctgaattggc aagaaaaatg gctggagggc tggaagaagn tggacccttc ttccttcttc 360
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```

```

<210> 771
<211> 207
<212> DNA
<213> Homo sapien

```

```

<400> 771
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cctcatatcc tccctactat gcctagaagg aataatacta tcaactgttca ttatagctac 120
tctcataaacc ctcaacaccc actccctctt agccaatatt gtgcctattg ccataactagt 180
ctttgccgcc tgcgaagcag cggtagg 207

```

```

<210> 772
<211> 384
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(384)
<223> n = A,T,C or G

```

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<400> 772
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aatTTaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggT 180
ttgtcgctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg ggggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tatagggggt agtccttgct atattatgct 360
tggttataat ttttcatctt tccc 384

```

```

<210> 773
<211> 182
<212> DNA
<213> Homo sapien

```

```

<400> 773
cccttttctt aacactcaca acaaaaactaa ctaataactaa catctcagac gctcagggaa 60
atagaaaccg tctgaactat cctgccccgcc atcatcctag tcctcatcgc cctcccatcc 120
ctacgcatcc ttacataaac agacgaggtc aacgatccct cccttaccat caaatcaatt 180
gg 182

```

```

<210> 774
<211> 191
<212> DNA
<213> Homo sapien

```

```

<400> 774
ccatggctag gtttatagat agttgggtgg ttgggtgtaa atgagtgagg caggagtccg 60

```

```

aggagggttag ttgtggcaat aaaaatgatt aaggatacta gtataagaga tcagggttcgt      120
ccttttagtgt tgtgtatggc tatcatttgt tttgagggtta gtttgattag tcattggttg      180
gtggtaatta g                                     191

```

```

<210> 775
<211> 192
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(192)
<223> n = A,T,C or G

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<400> 775
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angagggttag ttgaggcaat aaaaatgatn aaggatacta gtataagaga tcangttcgt      120
cctttacatg ttgngtatgg ctatcatttg ttttgaggct agnttgatta gtcattggtg      180
ggtggtaatt aa                                     192

```

```

<210> 776
<211> 144
<212> DNA
<213> Homo sapien

```

```

<400> 776
ctgacccccct agaaccctgg ctctgccatt agctaggacc taagactctg cccacatttt      60
ggtctgttct ctcccattac acataggttt gtctcagcat gcaagagttt ttcctttaa      120
aaaaaaaaaa aaaaaaaaaa aaaa                                     144

```

```

<210> 777
<211> 483
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(483)
<223> n = A,T,C or G

```

```

<400> 777
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aatTTaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt      180
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gtg                                     483

```

```

<210> 778
<211> 393
<212> DNA
<213> Homo sapien

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<220>
 <221> misc_feature
 <222> (1)...(393)
 <223> n = A,T,C or G

<400> 778
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 ctctgaagta cttgagctac tttagtatgt ccagcctatt gctttttggt ttagngngtc 300
 accataaata tcaggggcat aaaaggctat ctattcttaa ttcaaggata aaacagaaga 360
 agcttggtgn ataaaacaat agtcaagatc cag 393

<210> 779
 <211> 277
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(277)
 <223> n = A,T,C or G

<400> 779
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 ctatttcctg agcgtctgag atgtagtat tagttagttt tgttgtagt gttaggaaaa 180
 gggcatacag gactaggaag cagataagga aaatgactat gagggcgtga tcatgaaagg 240
 tgataagctc ttctatgata ggggaagtag cgtcttg 277

<210> 780
 <211> 328
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(328)
 <223> n = A,T,C or G

<400> 780
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 attttgccac actgcaacac cttacagatg tggaagatgt gaaatttgct atcaattatg 180
 actaccctaa ctctcagag gatttatattc atcgaattgg aagaactgct cgcagtacca 240
 aaacaggcac agcatacact ttctttacac ctaataacat aaagcagggg agcgacctta 300
 tctctgtgct tcgggaagct aancaaac 328

<210> 781
 <211> 305
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(305)
 <223> n = A,T,C or G

<400> 781
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 taccaaagtg tgcaacctac agaccctcag gtactgccct gtgacttctc tgtatgacat 180
 cacaaggctg ccaagtgcct gtttttctag aactaggagt tgggtgaggtt tggctantgc 240
 tgaaaccatg cataggattg gtttactaaa ttaaacctt attacgtacg tcctccaaaa 300
 gacag 305

<210> 782
 <211> 497
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(497)
 <223> n = A,T,C or G

<400> 782
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 aacctggatg gttttcaatg gcatggttag tcaaattcat ggtttttaac ttagaagcag 180
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 ccgtgggcct ttttaattgt aaacactgaa atgattgttg ggctgtggaa aacatttacc 300
 tatttacctt ggaagtttta aaagacagtc cacttttttag catgtgtgtt gcgtccagcc 360
 tgtggtcgtc ttaactaata aatgngattt ttctctcaaa aaaaaaacct ccccgggcgg 420
 ccgctcaagg gcnaattccn cacactggcg gccgttacta ggggatccga nctcggtcca 480
 agcttggcgt aatcatg 497

<210> 783
 <211> 364
 <212> PRT
 <213> Homo sapien

<400> 783
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 Ser Ser Gln Ile Ala Ala Ala Ala Ser Thr Gln Pro Glu Asp Asp Ile
 20 25 30
 Asn Thr Gln Arg Lys Lys Ser Gln Glu Lys Met Arg Glu Val Thr Asp
 35 40 45
 Ser Pro Gly Arg Pro Arg Glu Leu Thr Ile Pro Gln Thr Ser Ser His
 50 55 60
 Gly Ala Asn Arg Phe Val Pro Lys Ser Lys Ala Leu Glu Ala Val Lys
 65 70 75 80
 Leu Ala Ile Glu Ala Gly Phe His His Ile Asp Ser Ala His Val Tyr
 85 90 95
 Asn Asn Glu Glu Gln Val Gly Leu Ala Ile Arg Ser Lys Ile Ala Asp
 100 105 110
 Gly Ser Val Lys Arg Glu Asp Ile Phe Tyr Thr Ser Lys Leu Trp Ser

115	120	125
Asn Ser His Arg Pro Glu Leu Val Arg Pro Ala Leu Glu Arg Ser Leu		
130	135	140
Lys Asn Leu Gln Leu Asp Tyr Val Asp Leu Tyr Leu Ile His Phe Pro		
145	150	155
Val Ser Val Lys Pro Gly Glu Glu Val Ile Pro Lys Asp Glu Asn Gly		
165	170	175
Lys Ile Leu Phe Asp Thr Val Asp Leu Cys Ala Thr Trp Glu Ala Met		
180	185	190
Glu Lys Cys Lys Asp Ala Gly Leu Ala Lys Ser Ile Gly Val Ser Asn		
195	200	205
Phe Asn His Arg Leu Leu Glu Met Ile Leu Asn Lys Pro Gly Leu Lys		
210	215	220
Tyr Lys Pro Val Cys Asn Gln Val Glu Cys His Pro Tyr Phe Asn Gln		
225	230	235
Arg Lys Leu Leu Asp Phe Cys Lys Ser Lys Asp Ile Val Leu Val Ala		
245	250	255
Tyr Ser Ala Leu Gly Ser His Arg Glu Glu Pro Trp Val Asp Pro Asn		
260	265	270
Ser Pro Val Leu Leu Glu Asp Pro Val Leu Cys Ala Leu Ala Lys Lys		
275	280	285
His Lys Arg Thr Pro Ala Leu Ile Ala Leu Arg Tyr Gln Leu Gln Arg		
290	295	300
Gly Val Val Val Leu Ala Lys Ser Tyr Asn Glu Gln Arg Ile Arg Gln		
305	310	315
Asn Val Gln Val Phe Glu Phe Gln Leu Thr Ser Glu Glu Met Lys Ala		
325	330	335
Ile Asp Gly Leu Asn Arg Asn Val Arg Tyr Leu Thr Leu Asp Ile Phe		
340	345	350
Ala Gly Pro Pro Asn Tyr Pro Phe Ser Asp Glu Tyr		
355	360	

<210> 784

<211> 6353

<212> DNA

<213> Homo sapien

<400> 784

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<210> 785

<211> 5502

<212> DNA

<213> Homo sapien

<400> 785

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<210> 786

<211> 108

<212> PRT

<213> Homo sapiens

<400> 786

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Ala Ser Pro Arg Ser Pro Val Met Glu Ser Pro Lys Lys Lys Asn Gln
      35              40              45
Gln Leu Lys Val Gly Ile Leu His Leu Gly Ser Arg Gln Lys Lys Ile
      50              55              60
Arg Ile Gln Leu Arg Ser Gln Val Leu Gly Arg Glu Met Arg Asp Met
      65              70              75              80
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<210> 787

<211> 152

<212> PRT

<213> Homo sapiens

<400> 787

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 35 40 45
 Gly Ser Val Lys Arg Glu Asp Ile Phe Tyr Thr Ser Lys Leu Trp Ser
 50 55 60
 Thr Phe His Arg Pro Glu Leu Val Arg Pro Ala Leu Glu Asn Ser Leu
 65 70 75 80
 Lys Lys Ala Gln Leu Asp Tyr Val Asp Leu Tyr Leu Ile His Ser Pro
 85 90 95
 Met Ser Leu Lys Pro Gly Glu Glu Leu Ser Pro Thr Asp Glu Asn Gly
 100 105 110
 Lys Val Ile Phe Asp Ile Val Asp Leu Cys Thr Thr Trp Glu Ala Met
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<210> 788

<211> 1633

<212> DNA

<213> Homo sapiens

<400> 788

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<210> 789
 <211> 200
 <212> PRT
 <213> Homo sapien

<400> 789
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 35 40 45
 Trp Lys Thr Met Ser Gly Lys Glu Lys Ser Lys Phe Asp Glu Met Ala
 50 55 60
 Lys Ala Asp Lys Val Arg Tyr Asp Arg Glu Met Lys Asp Tyr Gly Pro
 65 70 75 80
 Ala Lys Gly Gly Lys Lys Lys Lys Asp Pro Asn Ala Pro Lys Arg Pro
 85 90 95
 Pro Ser Gly Phe Phe Leu Phe Cys Ser Glu Phe Arg Pro Lys Ile Lys
 100 105 110
 Ser Thr Asn Pro Gly Ile Ser Ile Gly Asp Val Ala Lys Lys Leu Gly
 115 120 125
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 130 135 140
 Lys Ala Ala Lys Leu Lys Glu Lys Tyr Glu Lys Asp Val Ala Asp Tyr
 145 150 155 160
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 <213> Homo sapiens

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<210> 791
 <211> 126
 <212> PRT
 <213> Homo sapiens

259

<400> 791

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 20 25 30

Gln Thr Gln Asn His Thr Ala Ser Pro Arg Ser Pro Val Met Glu Ser
 35 40 45

Pro Lys Lys Lys Asn Gln Gln Leu Lys Val Gly Ile Leu His Leu Gly
 50 55 60

Ser Arg Gln Lys Lys Ile Arg Ile Gln Leu Arg Ser Gln Cys Ala Thr
 65 70 75 80

Trp Lys Val Ile Cys Lys Ser Cys Ile Ser Gln Thr Pro Gly Ile Asn
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Leu Asp Leu Gly Ser Gly Val Lys Val Lys Ile Ile Pro Lys Glu Glu
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His Cys Lys Met Pro Glu Ala Gly Glu Glu Gln Pro Gln Val
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<210> 792

<211> 461

<212> DNA

<213> Homo sapiens

<400> 792

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<210> 793

<211> 108

<212> PRT

<213> Homo sapiens

<400> 793

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 20 25 30

Ala Ser Pro Arg Ser Pro Val Met Glu Ser Pro Lys Lys Lys Asn Gln

260

35 40 45
 Gln Leu Lys Val Gly Ile Leu His Leu Gly Ser Arg Gln Lys Lys Ile
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 Arg Ile Gln Leu Arg Ser Gln Val Leu Gly Arg Glu Met Arg Asp Met
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<210> 794

<211> 970

<212> DNA

<213> Homo sapiens

<400> 794

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<210> 795

<211> 152

<212> PRT

<213> Homo sapiens

<400> 795

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 Asn Asn Glu Glu Gln Val Gly Leu Ala Ile Arg Ser Lys Ile Ala Asp
 35 40 45

Gly Ser Val Lys Arg Glu Asp Ile Phe Tyr Thr Ser Lys Leu Trp Ser
 50 55 60

Thr Phe His Arg Pro Glu Leu Val Arg Pro Ala Leu Glu Asn Ser Leu
 65 70 75 80

Lys Lys Ala Gln Leu Asp Tyr Val Asp Leu Tyr Leu Ile His Ser Pro
 85 90 95

Met Ser Leu Lys Pro Gly Glu Glu Leu Ser Pro Thr Asp Glu Asn Gly
 100 105 110

Lys Val Ile Phe Asp Ile Val Asp Leu Cys Thr Thr Trp Glu Ala Met
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Glu Lys Cys Lys Asp Ala Gly Leu Ala Lys Ser Ile Gly Val Ser Asn
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Phe Asn Pro Gln Ala Ala Gly Asp
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<210> 796

<211> 2435

<212> DNA

<213> Homo sapiens

<400> 796

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<210> 797

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<212> PRT

<213> Homo sapiens

<400> 797

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```

```

Arg Gly Gly Val Gly Gly Glu Thr Arg Ala Ala Leu Ala Arg Ala Pro
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```

```

Pro Pro Gly Arg Ala Glu Trp Tyr Gly Pro Ala Gly Val Lys Ala Gly
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```

```

Gly Arg Arg Arg Val Pro Arg Arg Arg Arg Arg Trp Gly Cys Val Gln
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```

```

Glu Glu Arg Trp Ala Gly Pro Ala Arg Val Gly Gly Arg Pro Arg Gly
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```

Pro Gly Arg Ala Ala Ala Arg Arg Ala Ala Ala Ser Thr Arg Ala Ala
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<213> Homo sapiens

<400> 798

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263

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<400> 799
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 Pro Arg Pro Arg Gly Met Val Trp Pro Gly Arg Ser
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<210> 800
 <211> 2477
 <212> DNA

<213> Homo sapien

<400> 800

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<210> 801

<211> 1619

<212> DNA

<213> Homo sapien

<400> 801

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<210> 802

<211> 3115

<212> DNA

<213> Homo sapien

<400> 802

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<210> 803

<211> 1238

<212> DNA

<213> Homo sapien

<400> 803

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<210> 804

<211> 4637

<212> DNA

<213> Homo sapiens

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210> 805

<211> 394

<212> PRT

<213> Homo sapiens

<400> 805

Met Val Thr Met Glu Glu Leu Arg Glu Met Asp Cys Ser Val Leu Lys
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Arg Leu Met Asn Arg Asp Glu Asn Gly Gly Gly Ala Gly Gly Ser Gly
20 25 30

Ser His Gly Thr Leu Gly Leu Pro Ser Gly Gly Lys Cys Leu Leu Leu
35 40 45

Asp Cys Arg Pro Phe Leu Ala His Ser Ala Gly Tyr Ile Leu Gly Ser
50 55 60

Val Asn Val Arg Cys Asn Thr Ile Val Arg Arg Arg Ala Lys Gly Ser
65 70 75 80

Val Ser Leu Glu Gln Ile Leu Pro Ala Glu Glu Glu Val Arg Ala Arg

	85		90		95
Leu Arg Ser Gly Leu Tyr Ser Ala Val Ile Val Tyr Asp Glu Arg Ser					
	100		105		110
Pro Arg Ala Glu Ser Leu Arg Glu Asp Ser Thr Val Ser Leu Val Val					
	115		120		125
Gln Ala Leu Arg Arg Asn Ala Glu Arg Thr Asp Ile Cys Leu Leu Lys					
	130		135		140
Gly Gly Tyr Glu Arg Phe Ser Ser Glu Tyr Pro Glu Phe Cys Ser Lys					
	145		150		155
					160
Thr Lys Ala Leu Ala Ala Ile Pro Pro Pro Val Pro Pro Ser Ala Thr					
	165		170		175
Glu Pro Leu Asp Leu Asp Cys Ser Ser Cys Gly Thr Pro Leu His Asp					
	180		185		190
Gln Glu Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr Leu Gly Ser Ala					
	195		200		205
Tyr His Ala Ala Arg Arg Asp Met Leu Asp Ala Leu Gly Ile Thr Ala					
	210		215		220
Leu Leu Asn Val Ser Ser Asp Cys Pro Asn His Phe Glu Gly His Tyr					
	225		230		235
					240
Gln Tyr Lys Cys Ile Pro Val Glu Asp Asn His Lys Ala Asp Ile Ser					
	245		250		255
Ser Trp Phe Met Glu Ala Ile Glu Tyr Ile Asp Ala Val Lys Asp Cys					
	260		265		270
Arg Gly Arg Val Leu Val His Cys Gln Ala Gly Ile Ser Arg Ser Ala					
	275		280		285
Thr Ile Cys Leu Ala Tyr Leu Met Met Lys Lys Arg Val Arg Leu Glu					
	290		295		300
Glu Ala Phe Glu Phe Val Lys Gln Arg Arg Ser Ile Ile Ser Pro Asn					
	305		310		315
					320
Phe Ser Phe Met Gly Gln Leu Leu Gln Phe Glu Ser Gln Val Leu Ala					
	325		330		335
Thr Ser Cys Ala Ala Glu Ala Ala Ser Pro Ser Gly Pro Leu Gly Glu					
	340		345		350
Arg Gly Lys Thr Pro Ala Thr Pro Thr Ser Gln Phe Val Phe Ser Phe					
	355		360		365
Pro Val Ser Val Gly Val His Ser Ala Pro Ser Ser Leu Pro Tyr Leu					
	370		375		380

His Ser Pro Ile Thr Thr Ser Pro Ser Cys
385 390

<210> 806

<211> 302

<212> PRT

<213> Homo sapiens

<400> 806

Val Arg Ala Arg Leu Arg Ser Gly Leu Tyr Ser Ala Val Ile Val Tyr
5 10 15

Asp Glu Arg Ser Pro Arg Ala Glu Ser Leu Arg Glu Asp Ser Thr Val
20 25 30

Ser Leu Val Val Gln Ala Leu Arg Arg Asn Ala Glu Arg Thr Asp Ile
35 40 45

Cys Leu Leu Lys Gly Gly Tyr Glu Arg Phe Ser Ser Glu Tyr Pro Glu
50 55 60

Phe Cys Ser Lys Thr Lys Ala Leu Ala Ala Ile Pro Pro Pro Val Pro
65 70 75 80

Pro Ser Ala Thr Glu Pro Leu Asp Leu Gly Cys Ser Ser Cys Gly Thr
85 90 95

Pro Leu His Asp Gln Gly Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr
100 105 110

Leu Gly Ser Ala Tyr His Ala Ala Arg Arg Asp Met Leu Asp Ala Leu
115 120 125

Gly Ile Thr Ala Leu Leu Asn Val Ser Ser Asp Cys Pro Asn His Phe
130 135 140

Glu Gly His Tyr Gln Tyr Lys Cys Ile Pro Val Glu Asp Asn His Lys
145 150 155 160

Ala Asp Ile Ser Ser Trp Phe Met Glu Ala Ile Glu Tyr Ile Asp Ala
165 170 175

Val Lys Asp Cys Arg Gly Arg Val Leu Val His Cys Gln Ala Gly Ile
180 185 190

Ser Arg Ser Ala Thr Ile Cys Leu Ala Tyr Leu Met Met Lys Lys Arg
195 200 205

Val Arg Leu Glu Glu Ala Phe Glu Phe Val Lys Gln Arg Arg Ser Ile
210 215 220

Ile Ser Pro Asn Phe Ser Phe Met Gly Gln Leu Leu Gln Phe Glu Ser
225 230 235 240

Gln Val Leu Ala Thr Ser Cys Ala Ala Glu Ala Ala Ser Pro Ser Gly
 245 250 255

Pro Leu Arg Glu Arg Gly Lys Thr Pro Ala Thr Pro Thr Ser Gln Phe
 260 265 270

Val Phe Ser Phe Pro Val Ser Val Gly Val His Ser Ala Pro Ser Ser
 275 280 285

Leu Pro Tyr Leu His Ser Pro Ile Thr Thr Ser Pro Ser Cys
 290 295 300

<210> 807

<211> 3829

<212> DNA

<213> Homo sapiens

<400> 807

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<210> 808

<211> 781

<212> DNA

<213> Homo sapiens

<400> 808

```

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<210> 809

<211> 160

273

<212> PRT

<213> Homo sapiens

<400> 809

Met Arg Cys His Ala His Gly Pro Ser Cys Leu Val Thr Ala Ile Thr
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Arg Glu Glu Gly Gly Pro Arg Ser Gly Gly Ala Gln Ala Lys Leu Gly
 20 25 30

Cys Cys Trp Gly Tyr Pro Ser Pro Arg Ser Thr Trp Asn Pro Asp Arg
 35 40 45

Arg Phe Trp Thr Pro Gln Thr Gly Pro Gly Glu Gly Arg His Glu Arg
 50 55 60

His Thr Gln Thr Gln Asn His Thr Ala Ser Pro Arg Ser Pro Val Met
 65 70 75 80

Glu Ser Pro Lys Lys Lys Asn Gln Gln Leu Lys Val Gly Ile Leu His
 85 90 95

Leu Gly Ser Arg Gln Lys Lys Ile Arg Ile Gln Leu Arg Ser Gln Cys
 100 105 110

Ala Thr Trp Lys Val Ile Cys Lys Ser Cys Ile Ser Gln Thr Pro Gly
 115 120 125

Ile Asn Leu Asp Leu Gly Ser Gly Val Lys Val Lys Ile Ile Pro Lys
 130 135 140

Glu Glu His Cys Lys Met Pro Glu Ala Gly Glu Glu Gln Pro Gln Val
 145 150 155 160

<210> 810

<211> 624

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(624)

<223> n=A,T,C or G

<400> 810

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 acacggatgc cgaggaggca ggggtgagca ccgatgccgc cggccactat gactgcccgc 180
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 gcgtcccagg gccccagccc ggccacaaac actccctctc ctcgggcggc ttctcccccg 360
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```

actctcagaa gcccccaacg catcccggga caagtacag ctattctgcc cccagagact 540
gcctcacacc cctcaaccag acggccatga ctgccctttt gtgaacacaa tgtgaaagaa 600
gcctgctgtg gtactgagcg tcgg                                     624

```

```

<210> 811
<211> 572
<212> DNA
<213> Homo sapiens

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<400> 811
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```

<210> 812
<211> 594
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (594)
<223> n=A,T,C or G

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<400> 812
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cctggccgga acgtcagtggt gagttggcgg ccacgcgctg aggaggacgg gagagcccag 480
gcggcgggca gcagcgtcct cagggaaactg catactgcgg actctgtagt aaatggaagt 540
gcccaggccg acgtacccaa ggaactggag cgagaagaat ccggggctgc ggag          594

```

```

<210> 813
<211> 561
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (561)

```


<223> n=A,T,C or G

<400> 813

```
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nccccattgac gtccctctctt ctgaaaactc cgtgtggccc tcgctctgca ctgtcatgag 180
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ttaatccgaa atgtgttaan tcgancacat ggggccacgt ccaggacagc tcccatcgaa 480
ctctcnaggc tctctanctc agggatgaag gaggtnaagt gatcgatnct cacaagcgan 540
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<210> 814

<211> 307

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(307)

<223> n=A,T,C or G

<400> 814

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cccttcanag ccctagtcac aggcnnccagg gntgttttgt aanttaaant ttcnngaaaa 240
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nttacctt                                     307
```

<210> 815

<211> 784

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(784)

<223> n=A,T,C or G

<400> 815

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aagatgcatg ttttgcatgt cttttcttgt gtgatcgaaa gagtcaacat gcagatacga 540
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caatatgttg agatgtgcta ttttgaccac acttattcat cttggtcagg gattangagc 660
agacagcaag acctgtccct ttctgtctcc agttattcac tgagtaccag atgtttcaca 720
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aaac 784

<210> 816
<211> 813
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)...(813)
<223> n=A,T,C or G

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agcagctgct gccagagccc tcttgtagct tctttatttt ctgtttcttt ccagctttcc 180
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tgtgtgcca aagccagatt ttataaggt aaaataaatt aagaatttaa acagtaaaag 300
ccagtgtctc aaaatgtcag cattaataatg tgaaggggac agcaggggtgt gaaccggaaa 360
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gcccttaagg tcaatgccag tgtccagacg agcagtgtag aaaagctccc tgtgtgggtt 480
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tgggggcggg gagggggcag ggaatagtga gctggcttta ccaccttcag gatctcgaat 660
tgggcgcttg aacctaagaa agattgtgga cttatcaaaa gtcaccgctc agtggttcgtc 720
aagcatgtat ttatgtgacn atcatactag ggaggggatg gttgggaatt cttccatgtg 780
caaatttngn cccgcaanaa gcaaaactgg ng 813

<210> 817
<211> 229
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(229)
<223> n=A,T,C or G

<400> 817
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acanacacat ttttttttcc aggtaaaagc tgtttttagt ttgtagtaca aatgtgactg 180
catccaatac tgacacattg ttcctttggc ccacagtccc antcaccac 229

<210> 818
<211> 781
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(781)
<223> n=A,T,C or G

<400> 818
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cttgggttagg gctccagggg ggcctctcag gcaggaacag gcttttttcc tcctgtcttt 120
tcctcacatc acgtcctgcc ccaggtcact gcataaataa gtgcttttga aagtattcat 180
ctagaaagta acataaatac tgtacataga aaagggttgc cgcctcttag ccttcgcact 240
gccccagaga gctctccaca tattgcacac ggcctcccca gccctgtggg gtccaggcct 300
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<210> 819
<211> 199
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)...(199)
<223> n=A,T,C or G

<400> 819
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gttcttttgg gtcgggcag 199

<210> 820
<211> 211
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)...(211)
<223> n=A,T,C or G

<400> 820
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agacagtntc ntgtgtgtct ctctgtctcn aagtacncnc tgaggnatct gntntctgtn 180
tntnggtaca cngtatctct cntggncata t 211

<210> 821
<211> 952
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (1)...(952)
 <223> n=A,T,C or G

<400> 821
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 cagcaccaag acgaaatggg aaactacatg tccccagggt cgaggctgca ggggcagact 180
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<210> 822
 <211> 587
 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (1)...(587)
 <223> n=A,T,C or G

<400> 822
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<210> 823
 <211> 264
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(264)
 <223> n=A,T,C or G

<400> 823
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<210> 824

<211> 520

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(520)

<223> n=A,T,C or G

<400> 824

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cccaccgcnt aaanggcnga aattnccnan ccacacgggt 520

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<210> 825

<211> 2064

<212> DNA

<213> Homo sapiens

<400> 825

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<210> 826

<211> 2109

<212> DNA

<213> Homo sapiens

<400> 826

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taagacttt 2109

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Met Val Thr Met Glu Glu Leu Arg Glu Met Asp Cys Ser Val Leu Lys
5 10 15

Ser His Gly Thr Leu Gly Leu Pro Ser Gly Gly Lys Cys Leu Leu Leu
35 40 45

Val Asn Val Arg Cys Asn Thr Ile Val Arg Arg Arg Ala Lys Gly Ser
65 70 75 80

Leu Arg Ser Gly Leu Tyr Ser Ala Val Ile Val Tyr Asp Glu Arg Ser
100 105 110

Gln Ala Leu Arg Arg Asn Ala Glu Arg Thr Asp Ile Cys Leu Leu Lys
130 135 140

Thr Lys Ala Leu Ala Ala Ile Pro Pro Pro Val Pro Pro Ser Ala Thr
165 170 175

Gln Gly Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr Leu Gly Ser Ala
195 200 205

Leu Leu Asn Val Ser Ser Asp Cys Pro Asn His Phe Glu Gly His Tyr
225 230 235 240

Gln Tyr Lys Cys Ile Pro Val Glu Asp Asn His Lys Ala Asp Ile Ser
245 250 255

282

Ser Trp Phe Met Glu Ala Ile Glu Tyr Ile Asp Ala Val Lys Asp Cys
260 265 270

Arg Gly Arg Val Leu Val His Cys Gln Ala Gly Ile Ser Arg Ser Ala
275 280 285

Thr Ile Cys Leu Ala Tyr Leu Met Met Lys Lys Arg Val Arg Leu Glu
290 295 300

Glu Ala Phe Glu Phe Val Lys Gln Arg Arg Ser Ile Ile Ser Pro Asn
305 310 315 320

Phe Ser Phe Met Gly Gln Leu Leu Gln Phe Glu Ser Gln Val Leu Ala
325 330 335

Thr Ser Cys Ala Ala Glu Ala Ala Ser Pro Ser Gly Pro Leu Arg Glu
340 345 350

Arg Gly Lys Thr Pro Ala Thr Pro Thr Ser Gln Phe Val Phe Ser Phe
355 360 365

Pro Val Ser Val Gly Val His Ser Ala Pro Ser Ser Leu Pro Tyr Leu
370 375 380

His Ser Pro Ile Thr Thr Ser Pro Ser Cys
385 390